WHITE PINE BLISTER RUST CONTROL

IN THE

NORTHWESTERN REGION

January 1 to December 31, 1942

United States Department of Agriculture
Bureau of Entomology and Plant Quarantine
Division of Plant Disease Control
Blister Rust Control
618 Realty Building
Spokane, Washington

CONTENTS

	Page
White Pine Blister Rust Control in the Northwestern Region	1-27
I. Leadership, Coordination and Technical Direction by Bureau of Entomology and Plant Quarantine. Work Project BLR-1-4	1-7
II. Omnibus Tables	7-12
III. Cooperative Blister Rust Control on State and Privately-Owned Lands. Work Project BLR-3-4	13-19
IV. Blister Rust Control Operations on National Forests. Financial Project BLR-4	20-24
V. Blister Rust Control on National Parks. Financial Project BLR-5	25-27
Blister Rust Control, Inland Empire	28-89
Summary	28-37
Clearwater Operation	38-49
St. Joe Operation	50-59
Coeur d'Alene Operation	60-67
Kaniksu Operation	68-80
Montana Operation	81-89
Blister Rust Control on National and State Parks	90
Blister Rust Control on Mount Rainier National Park	91-95
Blister Rust Control on Glacier National Park	96-100
Cooperation with the Soil Conservation Service	101
Blister Rust Plot Studies	102-109
Developmental Work in Methods of Ribes Eradication and Progress of Ribes Ecology Work	110-135
Summary	110-113
The Interrelation Between Size of Crew, Width of Strip and Method of Laying String Line	114-117
Comparison Between Two Methods of Employing Crews in Gang Formation on Ribes Eradication	117-119
Effect of Grazing on Ribes and Western White Pine Regeneration	119-124
Ecology Studies of Ribes and Western White Pine Regeneration	124-128
Resprouting Habits of Ribes lacustre	128-129
Ribes Regeneration Key for the Western White Pine Region	129-130
Slash Disposal Measures and their Effects upon Ribes and Western White Pine Regeneration	130-132
Laboratory and Greenhouse Work	132-134
List of Special Reports	135
Photographic and Educational Work	136-138
Appendix	
Accounts (M. L. McWold) - Bureau of Entomology and Plant Quarantine	1-3

WHITE PINE BLISTER RUST CONTROL IN THE NORTHWESTERN REGION

January 1 to December 31, 1942

Herman E. Swanson, Senior Pathologist

* * * * * * *

Funds for white pine blister rust control contained in the Agricultural Appropriation Act are allotted to specific financial projects. In some instances these financial projects have been subdivided into work projects. In the Northwestern Region the following projects are involved.

Bureau of Entomology and Plant Quarantine:

Work Projects: BLR-1-4, Leadership, coordination and technical direction of white pine blister rust control in the Northwestern Region.

BLR-3-4, Cooperative blister rust control on state and privately-owned lands in the Northwestern Region.

Forest Service:

Financial Project: BLR-4, Blister rust control operations on National Forests. (Not yet divided into work projects.)

Department of Interior:

Financial Project: BLR-5, Blister rust control on National Parks.

Brief reports covering the four above mentioned projects are presented. As in previous annual reports, the practice of reporting by individual operations is continued. Each operation constitutes an individual territorial unit, supervised by a separate field organization, and generally includes a National Forest and adjacent state and private lands. Thus there is a certain amount of uniformity of technical problems within an operation and this represents a more satisfactory unit for presenting technical data and descriptions of field conditions. In addition, there is definite interest on the part of cooperators in the progress of control work on lands of all ownerships within their respective territories.

I. Leadership, Coordination and Technical Direction of White Pine Blister Rust Control in the Northwestern Region by the Bureau of Entomology and Plant Quarantine. Work Project BLR-1-4.

White pine blister rust control work in the 1942 season was handicapped to a great degree by conditions resulting from the war emergency. CCC and WPA crews, which during the past several years had contributed much to blister rust control, were lost to the project. The great expansion in the Inland Empire of war industries and the building of Army and Navy plants and training stations caused a serious labor shortage which meant that blister rust workers

had to be recruited largely from high school and college students and it was not possible for any agency to maintain its blister rust camps at full strength during the season. Heavy rainfall prevented the performance of much field work in May and June which also resulted in a high turnover of labor.

These factors caused a serious reduction in the total control program with the result that only 49,906 acres were worked in 1942, of which 7,147 acres represented initial working and 42,759 acres reeradication. The total progress of control through 1942 is as follows: 1,890,674 acres first working; 450,360 acres reeradication; 591,576 acres unworked; 205,494 acres on a deferred basis. These data apply to a white pine area of 2,687,744 acres in the states of Idaho, Montana and Washington and do not include Colorado and Wyoming, where except for an experimental ribes eradication project no extensive control work has been done.

The heavy rains in May and June were favorable for intensification of blister rust on areas where fruiting blister rust cankers were numerous. As in 1941, the heaviness of the rainfall appeared to restrict the distance of spread from pine to ribes as indicated by the small amount of infection on ribes where pine infection was light.

Substantial progress has been made in controlling blister rust in this region. On a conservative estimate approximately one million acres of white pine have been permanently protected by eradication of ribes or have been placed on a deferred basis, with a considerable additional acreage requiring a small amount of rework to accomplish permanent control. The major portion of the control effort during the last several years has been devoted to completing work on such areas. About 50 per cent of the 1,405,867 acres given initial working during the height of emergency relief work projects in 1933-1936 required additional workings and aggressive efforts have been made since 1937 to complete this job.

Through 1942, the initial treatment is 76 per cent completed and the estimated rework job providing the entire control area is given initial working is about 22 per cent completed.

Under Work Project BLR-1-4, the Bureau of Entomology and Plant Quarantine is responsible under the Agricultural Appropriation Acts for general leadership in the control of blister rust in the states of Idaho, Montana, Washington, Colorado and Wyoming. In this capacity it represents the public in the planning and coordination of control projects and provides technical direction in the application of control measures on forest land of all types of ownership, public and private, either directly or in cooperation with the owners or agencies administering such land.

These responsibilities are administered through the Northwestern Region Blister Rust Control Office located at Spokane, Washington. In 1942, the regional staff employed under this project was as follows:

1. Regional Leader in Charge, H. E. Swanson, Senior Pathologist

2. Assistant Regional Leader, E. L. Joy, Forester

3. Cooperative Local Control:

   a. Montana Operation:
      Technical Supervisor, A. S. Skoglund, Assistant Pathologist
   b. Clearwater Operation, Idaho:
      Technical Supervisor, F. J. Heinrich, Associate Pathologist
      Checking Supervisor, H. J. Faulkner, Chief Scientific Aid
   c. St. Joe Operation, Idaho:
      Technical Supervisor, H. J. Hartman, Associate Forester
      Checking Supervisor, W. F. Painter, Assistant Pathologist
      Assistant Supervisor, J. C. Gynn, Assistant Pathologist
   d. Coeur d'Alene Operation, Idaho:
      Technical Supervisor, R. L. MacLeod, Associate Pathologist
   e. Kaniksu Operation, Idaho and Washington:
      Technical Supervisor, F. O. Walters, Associate Pathologist
      Checking Supervisor, H. A. Brischle, Assistant Pathologist
   f. National Parks:
      Technical Supervisor, M. C. Riley, Associate Forester

4. Projects:

   a. Control Investigations:
      C. R. Stillinger, Assistant Pathologist
      C. M. Chapman, Chief Scientific Aid
      R. E. Myers, Agent
   b. Education and Information:
      H. M. Cowling, Chief Scientific Aid
      J. C. Gonyou, Assistant Engineering Draftsman
   c. Development of Ribes Eradication Methods:
      V. D. Moss*, Associate Forest Ecologist
      J. F. Breakey*, Assistant Pathologist

5. Business Administration and Clerical:

   a. E. G. Schmidt, Senior Administrative Assistant
      E. K. LaPrey, Field Assistant
      L. C. Miller, Senior Automobile Mechanic
   b. M. L. McWold, Senior Clerk
      M. M. McLean, Assistant Clerk-Stenographer
   c. L. E. Klatt, Senior Clerk
      J. R. Pringle, Assistant Clerk-Stenographer
      M. Wilson, Junior Clerk-Stenographer
      L. M. Metzger, Junior Clerk-Stenographer
   d. H. D. Langley, Junior Administrative Assistant in charge of personnel

*Personnel assigned to Northwestern Region by H. R. Offord, in charge of methods development in the West. Work Project: BLR-1-6.

The Northwestern Region Office of Blister Rust Control cooperated with the U. S. Forest Service, National Park Service, State of Idaho, and the Clearwater, Potlatch, and Priest Lake Timber Protective Associations of Idaho in providing the technical direction and planning of the field work. This included the location and designation of work areas for 34 camps and 1,464 workers on National Forests, 2 camps and 70 workers on National Parks, and 7 camps and 290 workers on state and private lands. Throughout the season, technical direction, training of field workers and checking of work areas was maintained to secure proper eradication methods and to insure attainment of protection standards. Preeradication surveys were made on 19,315 acres and 54 miles of disease survey strip were run to determine the status of the rust and the urgency of ribes eradication work. Uniform maps and records were maintained showing the areas on which work was performed and the control status of all areas.

A summary of the progress of ribes eradication during 1942 and during the entire period of control work in the Northwestern Region is presented in tables 1 and 2:

TABLE 1

PROGRESS OF RIBES ERADICATION IN THE NORTHWESTERN REGION IN 1942

State	Ownership	Acres Worked			
		First	Second	Third	Total
Idaho	National Forests	4,627	15,799	4,244	24,670
	Public Domain		245	60	305
	State	269	5,131	624	6,024
	Private	90	6,335	4,560	10,985
	Total	4,986	27,510	9,488	41,984
Montana	National Forests	512	880	656	2,048
	National Parks	262	731		993
	Private		76	416	492
	Total	774	1,687	1,072	3,533
Washington	National Forests	1,387	798		2,185
	National Parks		71	2,133	2,204
	Total	1,387	869	2,133	4,389
Northwestern Region	National Forests	6,526	17,477	4,900	28,903
	National Parks	262	802	2,133	3,197
	Public Domain		245	60	305
	State	269	5,131	624	6,024
	Private	90	6,411	4,976	11,477
	Total	7,147	30,066	12,693	49,906

TABLE 2

STATUS OF RIBES ERADICATION IN THE NORTHWESTERN REGION, 1923-1942

State	Ownership	Acres Worked				Acres Unworked	Acres Deferred	Total White Pine Area
		First	Second	Third	Total			
Idaho	Nat. Forest	867,326	196,344	23,648	1,087,318	206,310	56,454	1,130,090
	Pub. Domain	16,482	5,570	202	22,254	14,068	1,040	31,590
	State	264,018	48,097	7,868	319,983	48,822	32,110	344,950
	Private	489,695	98,601	17,149	605,445	215,398	95,932	801,025
	Total	1,637,521	348,612	48,867	2,035,000	484,598	185,536	2,307,655
Montana	Nat. Forest	104,266	7,256	1,553	113,075	42,149	17,468	163,883
	Nat. Parks	2,895	731		3,626	7,105		10,000
	Pub. Domain	40			40			40
	State	576			576	234		810
	Private	20,857	2,043	1,676	24,576	12,660	2,490	36,007
	Total	128,634	10,030	3,229	141,893	62,148	19,958	210,740
Washington	Nat. Forest	69,440	13,748	633	83,821	29,870		99,310
	Nat. Parks	8,254	5,028	3,944	17,226			8,254
	Pub. Domain	315	60		375			315
	State	6,832	3,935	2,114	12,881	3,018		9,850
	Private	39,678	7,593	2,567	49,838	11,942		51,620
	Total	124,519	30,364	9,258	164,141	44,830		169,349
Subtotal	Nat. Forest	1,041,032	217,348	25,834	1,284,214	278,329	73,922	1,393,283
	Nat. Parks	11,149	5,759	3,944	20,852	7,105		18,254
	Pub. Domain	16,837	5,630	202	22,669	14,068	1,040	31,945
	State	271,426	52,032	9,982	333,440	52,074	32,110	355,610
	Private	550,230	108,237	21,392	679,859	240,000	98,422	888,652
	Total	1,890,674	389,006	61,354	2,341,034	591,576	205,494	2,687,744
Colo-rado	Nat. Forest	14,859	1,962		16,821	184,141		199,000
	Nat. Parks					7,000		7,000
	Total	14,859	1,962		16,821	191,141		206,000
Wyoming	Nat. Forest	21,760			21,760	200,240		222,000
	Nat. Parks					18,700		18,700
	Indian Res.					11,000		11,000
	Total	21,760			21,760	229,940		251,700
Sub-total	Nat. Forest	36,619	1,962		38,581	384,381		421,000
	Nat. Parks					25,700		25,700
	Indian Res.					11,000		11,000
	Total	36,619	1,962		38,581	421,081		457,700
Total North-western Region	Nat. Forest	1,077,651	219,310	25,834	1,322,795	662,710	73,922	1,814,283
	Nat. Parks	11,149	5,759	3,944	20,852	32,805		43,954
	Pub. Domain	16,837	5,630	202	22,669	14,068	1,040	31,945
	Indian Res.					11,000		11,000
	State	271,426	52,032	9,982	333,440	52,074	32,110	355,610
	Private	550,230	108,237	21,392	679,859	240,000	98,422	888,652
	Total	1,927,293	390,968	61,354	2,379,615	1,012,657	205,494	3,145,444

Funds for blister rust control work in the Northwestern Region are provided by federal, state and private agencies.

	Fiscal Year 1942	Fiscal Year 1943
Regular Federal Allotments:		
Bureau of Entomology and Plant Quarantine:		
Work Project BLR-1-4	$ 75,605.74	$ 80,000.00
Work Project BLR-3-4	27,041.00	64,695.00
Subtotal	$102,646.74	$144,695.00
Forest Service:		
Financial Project BLR-4	$494,000.00	$706,000.00
National Park Service:		
Financial Project BLR-5	$ 14,000.00	$ 24,190.00
Total Federal Allotments	$609,441.00	$874,885.00
State and Private Funds: (Deposited with U. S. Treasury)		
State of Idaho	$14,243,60	$22,106.35
Clearwater Timber Protective Association	6,366.32	6,000.00
Potlatch Timber Protective Association	5,107.46	5,200.34
Priest Lake Timber Protective Association	4,282.62	4,240.44
Total State and Private Funds	$30,000.00	$37,547.13

The expenditures from the above allotments during the calendar year 1942 were as follows:

	Idaho	Montana	Washington	Total
Bureau of Entomology and Plant Quarantine:				
Work Project BLR-1-4	$ 65,670.54	$10,528.08	$ 7,178.49	$ 83,377.11
Work Project BLR-3-4	38,880.58	-	-	38,880.58
Total	$104,551.12	$10,528.08	$ 7,178.49	$122,257.69
Forest Service:				
Financial Project BLR-4	$411,127.14	$39,740.29	$37,953.70	$488,821.13
National Park Service:				
Financial Project BLR-5	-	$ 8,755.42	$ 8,328.73	$ 17,084.15
Subtotal-Federal Funds	$515,678.26	$59,023.79	$53,460.92	$628,162.97
State and Private	$ 38,202.46	-	-	$ 38,202.46
Total Expenditures	$553,880.72	$59,023.79	$53,460.92	$666,365.43

A summary of the expenditures, not including cost of CCC work, on blister rust control activities for all years, 1922-1942, is as follows:

Bureau of Entomology and Plant Quarantine: (1922-1942)

State	Regular	ERA(WPA)	NIRA(PWA)	Total
Idaho	$1,338,835.61	$3,002,140.71	$470,841.62	$4,811,817.94
Montana	211,572.00	196,847.11	88,306.79	496,725.90
Washington	226,770.96	459,112.87	105,199.60	791,083.43
Subtotal	1,777,178.57	3,658,100.69	664,348.01	6,099,627.27
Colorado	11,852.04	59,396.51	8,041.45	79,290.00
Wyoming	11,314.28	58,283.96	7,107.41	76,705.65
Subtotal	23,166.32	117,680.47	15,148.86	155,995.65
Grand Total	$1,800,344.89	$3,775,781.16	$679,496.87	$6,255,622.92

Forest Service: (1930-1942)

State	Regular	ERA(WPA)	NIRA(PWA)	Total
Idaho	$2,921,679.00	$421,155.19	$1,369,184.16	$4,712,018.35
Montana	214,810.65	136,851.46	149,858.06	501,520.17
Washington	172,559.42	-	134,320.68	306,880.10
Total	$3,309,049.07	$558,006.65	$1,653,362.90	$5,520,418.62

National Park Service: (1930-1942)

State	Regular
Montana	$ 8,755.42
Washington	39,454.73
Total	$48,210.15

State and Private: (1928-1942)

State	State	Private	Total
Idaho	$162,452.91	$119,580.81	$282,033.72*

*Funds deposited with the U. S. Treasury and expended by the Bureau of Entomology and Plant Quarantine.

II. Omnibus Tables

Complete summaries of blister rust control work are presented in the following tables. In the summary of expenditures, CCC work is valued at $1.50 per CCC man-day on ribes eradication. Values are also placed on contributed service from state and private agencies and are listed as "indirect aid." One thousand dollars of the Idaho blister rust appropriation expended by the state is included under "direct aid."

OMNIBUS TABLES

* * *

TABLE 1

SUMMARY OF 1942 RIBES ERADICATION

State	Initial Eradication Work			Reeradication Work			Totals		
	Acreage Worked	Number Ribes Destroyed	Number 8-Hour Man-Days	Acreage Worked	Number Ribes Destroyed	Number 8-Hour Man-Days	Acreage Worked	Number Ribes Destroyed	Number 8-Hour Man-Days
Idaho	4,986	1,448,134	9,699	36,998	2,787,095	35,549	41,984	4,235,229	45,248
Montana	774	371,368	2,240	2,759	320,532	2,579	3,533	691,900	4,819
Washington	1,387	684,757	2,325	3,002	44,360	1,600	4,389	729,117	3,925
Total	7,147	2,504,259	14,264	42,759	3,151,987	39,728	49,906	5,656,246	53,992

State	Ribes Per Acre		Man-Days Per Acre		Number Regular Camps	Number of Employees		
	Initial Eradication	Reeradication	Initial Eradication	Reeradication		Regular Laborers	All Supervision	Total Employees
Idaho	290	75	1.95	.96	36	1,485	66	1,551
Montana	480	116	2.89	.93	4	156	8	164
Washington	494	15	1.68	.53	3	105	4	109
Total	350	74	2.00	.93	43	1,746	78	1,824

TABLE 2

SUMMARY OF 1942 RIBES ERADICATION - BY PROGRAMS
(Including all work - initial and reeradication)

All work performed by regular and cooperative crews.

TABLE 3

SUMMARY OF RIBES ERADICATION BY LAND OWNERSHIP - 1942

Land Ownership	Initial Eradication			Reeradication			Totals		
	Acreage Worked	Number Ribes Destroyed	Number 8-Hour Man-Days	Acreage Worked	Number Ribes Destroyed	Number 8-Hour Man-Days	Acreage Worked	Number Ribes Destroyed	Number 8-Hour Man-Days
National Forests	6,526	2,164,002	13,255	22,377	1,951,587	23,588	28,903	4,115,589	36,843
Other Public Domain	-	-	-	305	23,410	315	305	23,410	315
National Parks	262	37,155	301	2,935	136,396	1,934	3,197	173,551	2,235
Subtotal Federal	6,788	2,201,157	13,556	25,617	2,111,393	25,837	32,405	4,312,550	39,393
State and Private	359	303,102	708	17,142	1,040,594	13,891	17,501	1,343,696	14,599
Grand Total	7,147	2,504,259	14,264	42,759	3,151,987	39,728	49,906	5,656,246	53,992
NATIONAL PARKS									
Mount Rainier	-	-	-	2,204	13,790	1,171	2,204	13,790	1,171
Glacier	262	37,155	301	731	122,606	763	993	159,761	1,064
Total	262	37,155	301	2,935	136,396	1,934	3,197	173,551	2,235
STATE AND PRIVATE LANDS									
Idaho	359	303,102	708	16,650	1,006,294	13,534	17,009	1,309,396	14,242
Montana	-	-	-	492	34,300	357	492	34,300	357
Total	359	303,102	708	17,142	1,040,594	13,891	17,501	1,343,696	14,599
NATIONAL FORESTS									
Clearwater	1,616	-	-	1,758	-	-	3,374	-	-
St. Joe	50	-	-	12,055	-	-	12,105	-	-
Coeur d'Alene	1,114	-	-	1,744	-	-	2,858	-	-
Kaniksu	3,234	-	-	5,284	-	-	8,518	-	-
Cabinet	512	-	-	1,536	-	-	2,048	-	-
Total	6,526	2,164,002	13,255	22,377	1,951,587	23,588	28,903	4,115,589	36,843

TABLE 4

SUMMARY OF ALL OTHER CONTROL WORK FOR 1942

State	Nursery Sanitation					Mapping Control Areas		Treatment of Infected White Pines			
	Number Nurs. Worked	Number White Pines in Nurseries	Number Acres Worked	Number Ribes Destroyed	Number 8-Hour Man-Days	Number Acres Mapped (W.P. & Prot. Zones)	Number 8-Hour Man-Days	Total Number Pines Examined	Number Infected Pines Cut Down	Number Infected Pines Treated	Number 8-Hour Man-Days
Idaho	-	-	-	-	-	19,315	128	8,592	850	7,742	88
Montana	1	12,500,000	613	164,372	754	-	-	1,100	50	390	4
Washington	-	-	-	-	-	-	-	5,824	-	3,669	93
Total	1	12,500,000	613	164,372	754	19,315	128	15,516	900	11,801	185

TABLE 5

SUMMARY OF EXPENDITURES FOR 1942

State	Total			Recapitulation of Federal Funds					
				Regular Funds					Emergency Funds State W.P.A.
	Federal (All Agencies Including State WPA Projects)	State (Including All Coop. Funds)	Grand Total	Bureau of Entomology and Plant Quarantine Leadership & Coord. (3101)	Bureau of Entomology and Plant Quarantine Lea Act (3103)	Forest Service	National Parks	Total Regular Funds	
Idaho	$529,838.41	$40,202.46	$570,040.87	$65,670.54	$38,880.58	$411,127.14	-	$515,678.26	$14,160.15
Montana	59,023.79	3,000.00	62,023.79	10,528.08	-	39,740.29	$ 8,755.42	59,023.79	-
Washington	54,315.22	1,000.00	55,315.22	7,178.49	-	37,953.70	8,328.73	53,460.92	854.30
Total	$643,177.42	$44,202.46	$687,379.88	$83,377.11	$38,880.58	$488,821.13	$17,084.15	$628,162.97	$15,014.45

State	Financial Projects								
	BLR-1 - Leadership, Coordination and Technical Direction				BLR-3 - Cooperative Blister Rust Control on State and Privately-Owned Lands			BLR-4 Forest Service	BLR-5 National Parks
	Indirect Aid State*	Federal Regular	Federal Emergency	Total	Direct Aid State*	Federal-Regular	Total		
Idaho	$1,000.00	$65,670.54	$14,160.15	$ 80,830.69	$39,202.46	$38,880.58	$78,083.04	$411,127.14	-
Montana	3,000.00	10,528.08	-	13,528.08	-	-	-	39,740.29	$ 8,755.42
Washington	1,000.00	7,178.49	854.30	9,032.79	-	-	-	37,953.70	8,328.73
Total	$5,000.00	$83,377.11	$15,014.45	$103,391.56	$39,202.46	$38,880.58	$78,083.04	$488,821.13	$17,084.15

*Including all local cooperative funds

TABLE 1A

SUMMARY OF ALL RIBES ERADICATION 1918-1942 (INCLUSIVE)

State	Initial Eradication Work				Reeradication Work			
	Gross Acreage Reported Initially Worked	Net Acreage Worked in Control Area	Number Ribes Destroyed	Number 8-Hour Man-Days	Gross Acreage Reported Reworked	Net Acreage Reworked in Control Area	Number Ribes Destroyed	Number 8-Hour Man-Days
Idaho	1,637,521	1,637,521	320,787,595	1,321,602	397,479	397,479	56,129,666	429,332
Montana	128,634	128,634	16,716,277	90,364	13,259	13,259	1,749,312	16,223
Washington	124,519	124,519	28,552,733	104,686	39,622	39,622	5,752,356	35,249
Subtotal	1,890,674	1,890,674	366,056,605	1,516,652	450,360	450,360	63,631,334	480,804
Colorado	14,859	14,859	410,649	6,292	1,962	1,962	86,886	664
Wyoming	21,760	21,760	1,085,771	6,940	-	-	-	-
Subtotal	36,619	36,619	1,496,420	13,232	1,962	1,962	86,886	664
Total	1,927,293	1,927,293	367,553,025	1,529,884	452,322	452,322	63,718,220	481,468

State	Initial and Reeradication				Per Acre			
	Gross Initial and Reworked Acreage Reported	Net Acreage Initial and Rework	Number Ribes Destroyed	Number 8-Hour Man-Days	Ribes		Man-Days	
					Initial Erad.	Re-erad.	Initial Erad.	Re-erad.
Idaho	2,035,000	2,035,000	376,917,261	1,750,934	196	141	.81	1.08
Montana	141,893	141,893	18,465,589	106,587	130	132	.70	1.22
Washington	164,141	164,141	34,305,089	139,935	229	145	.94	.89
Subtotal	2,341,034	2,341,034	429,687,939	1,997,456	194	141	.80	1.07
Colorado	16,821	16,821	497,535	6,956	28	44	.42	.34
Wyoming	21,760	21,760	1,085,771	6,940	50	-	.32	-
Subtotal	38,581	38,581	1,583,306	13,896	41	44	.36	.34
Total	2,379,615	2,379,615	431,271,245	2,011,352	191	141	.79	1.06

TABLE 2A

STATUS OF BLISTER RUST CONTROL, 1918-1942, (INCLUSIVE)

State	Acreage of White Pine in Net Control Area	Acreage of Net Control Area (White Pine and Protection Zones)	Acreage of Net Control Area Initially Worked	Acreage of Net Control Area Reworked		Percentage Net Control Area		Acreage in Net Control Area Still Needing Initial Protection	Acreage in Net Control Area Now on Maintenance Basis*
				1st Rework	Other Reworkings	Initially Worked	First Rework		
Idaho	2,122,119	2,122,119	1,637,521	348,612	48,867	77.16	16.43	484,598	677,400
Montana	190,792	190,782	128,634	10,030	3,229	67.42	5.26	62,148	68,700
Washington	169,349	169,349	124,519	30,364	9,258	73.53	17.93	44,830	49,000
Subtotal	2,482,250	2,482,250	1,890,674	389,006	61,354	76.17	15.67	591,576	795,100
Colorado	206,000**	206,000**	14,859	1,962	-	7.21	.95	191,141	8,000
Wyoming	251,700**	251,700**	21,760	-	-	8.65	-	229,940	9,000
Subtotal	457,700	457,700	36,619	1,962	-	8.00	.43	421,081	17,000
Total	2,939,950	2,939,950	1,927,293	390,968	61,354	65.57	13.30	1,012,657	812,100

*Maintenance - Any area on which the ribes are so scarce that danger from blister rust is negligible for an indefinite period. To assure the continuation of this safe condition requires periodic examinations and in some instances ribes eradication by scouting methods.

**Indefinite

TABLE 3A

SUMMARY OF ALL RIBES ERADICATION BY PROGRAMS 1918-1942 (INCLUSIVE)
(Initial and Reeradication)

State	Regular and Cooperative*			W.P.A. and E.R.A.		
	Acreage Worked	Number Ribes Destroyed	Number 8-Hour Man-Days	Acreage Worked	Number Ribes Destroyed	Number 8-Hour Man-Days
Idaho	591,775	99,676,677	468,901	500,970	91,269,072	411,890
Montana	22,997	3,526,601	24,907	57,800	6,300,929	41,591
Washington	29,730	7,695,647	25,012	39,973	13,632,288	53,107
Subtotal	644,502	110,898,925	518,820	598,743	111,202,189	506,588
Colorado	-	-	-	16,821	497,535	6,956
Wyoming	-	-	-	21,760	1,085,771	6,940
Subtotal	-	-	-	38,581	1,583,306	13,896
Total	644,502	110,888,925	518,820	637,324	112,785,495	520,484

State	C.C.C. and S.C.S.			P.W.A. or N.R.A.			Total Emergency Program (W.P.A.-C.C.C.-P.W.A.)		
	Acreage Worked	Number Ribes Destroyed	Number 8-Hour Man-Days	Acreage Worked	Number Ribes Destroyed	Number 8-Hour Man-Days	Acreage Worked	Number Ribes Destroyed	Number 8-Hour Man-Days
Idaho	590,414	123,729,240	661,693	351,841	62,242,272	208,450	1,443,225	277,240,584	1,282,033
Montana	17,108	1,795,850	15,273	43,988	6,842,309	24,816	118,896	14,938,988	81,680
Washington	33,288	4,780,400	37,397	61,150	8,206,754	24,419	134,411	26,619,442	114,923
Subtotal	640,810	130,305,490	714,363	456,979	77,291,335	257,685	1,696,532	318,799,014	1,478,636
Colorado	-	-	-	-	-	-	16,821	497,535	6,956
Wyoming	-	-	-	-	-	-	21,760	1,085,771	6,940
Subtotal	-	-	-	-	-	-	38,581	1,583,306	13,896
Total	640,810	130,305,490	714,363	456,979	77,291,335	257,685	1,735,113	320,382,320	1,492,532

*This includes work of the Bureau, cooperating state and private agencies, Forest Service and Interior Department work with regular funds.

TABLE 4A

SUMMARY OF RIBES ERADICATION BY LAND OWNERSHIPS 1918-1942 (INCLUSIVE)

Land Ownership	Acreage of White Pine in Net Control Area	Net Control Area		Initial Eradication Work				Reeradication Work				Totals (Initial & Rework)			
		Total Acreage (W.P.& Prot. Zones)	Acreage Not Yet Worked Initially	Gross Acreage Reported Initially Worked	Net Acreage Worked in Control Area	Gross Number Ribes Destroyed	Gross Number 8-Hour Man-Days	Gross Acreage Reported Reworked	Net Acreage Reworked in Control Area	Gross Number Ribes Destroyed	Gross Number 8-Hour Man-Days	Gross Initial and Reworked Acreage Reported	Net Acreage Initial and Rework	Gross Number Ribes Destroyed	Gross Number 8-Hour Man-Days
National Forests, R-1	1,319,361	1,319,361	278,329	1,041,032	1,041,032	216,877,834	936,961	243,182	243,182	30,968,054	275,139	1,284,214	1,284,214	247,845,888	1,212,100
National Forests, R-2,4	421,000*	421,000*	384,381*	36,619	36,619	1,496,420	13,232	1,962	1,962	86,886	664	38,581	38,581	1,583,306	13,896
Subtotal	1,740,361	1,740,361	662,710	1,077,651	1,077,651	218,374,254	950,193	245,144	245,144	31,054,940	275,803	1,322,795	1,322,795	249,429,194	1,225,996
Other Public Domain	30,905	30,905	14,068	16,837	16,837	2,807,572	10,896	5,832	5,832	814,443	6,527	22,669	22,669	3,622,015	17,423
National Parks	43,954*	43,954*	32,805*	11,149	11,149	2,001,503	13,204	9,703	9,703	617,743	9,613	20,852	20,852	2,619,246	22,817
Indian Reservations	11,000*	11,000*	11,000*	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal (Federal)	1,826,220	1,826,220	720,583	1,105,637	1,105,637	223,183,329	974,293	260,679	260,679	32,487,126	291,943	1,366,316	1,366,316	255,670,455	1,266,236
State and Private	1,113,730	1,113,730	292,074	821,656	821,656	144,369,696	555,591	191,643	191,643	31,231,094	189,525	1,013,299	1,013,299	175,600,790	745,116
Grand Total	2,939,950	2,939,950	1,012,657	1,927,293	1,927,293	367,553,025	1,529,884	452,322	452,322	63,718,220	481,468	2,379,615	2,379,615	431,271,245	2,011,352
NATIONAL PARKS															
Mount Rainier	8,254	8,254	-	8,254	8,254	1,640,507	10,070	8,972	8,972	495,137	8,850	17,226	17,226	2,135,644	18,920
Glacier	10,000	10,000	7,105	2,895	2,895	360,996	3,134	731	731	122,606	763	3,626	3,626	483,602	3,897
Yellowstone	12,900	12,900	12,900	-	-	-	-	-	-	-	-	-	-	-	-
Grand Teton	5,800	5,800	5,800	-	-	-	-	-	-	-	-	-	-	-	-
Rocky Mountain	7,000	7,000	7,000	-	-	-	-	-	-	-	-	-	-	-	-
Total	43,954	43,954	32,805	11,149	11,149	2,001,503	13,204	9,703	9,703	617,743	9,613	20,852	20,852	2,619,246	22,817
INDIAN RESERVATIONS															
Shoshone	11,000*	11,000*	11,000*	-	-	-	-	-	-	-	-	-	-	-	-
STATE AND PRIVATE LANDS															
Idaho	1,017,933	1,017,933	264,220	753,713	753,713	126,141,844	489,796	171,715	171,715	27,100,840	167,189	925,428	925,428	153,242,684	656,985
Montana	34,327	34,327	12,894	21,433	21,433	2,773,348	14,835	3,719	3,719	475,489	4,469	25,152	25,152	3,248,837	19,304
Washington	61,470	61,470	14,960	46,510	46,510	15,454,504	50,960	16,209	16,209	3,654,765	17,867	62,719	62,719	19,109,269	68,827
Total	1,113,730	1,113,730	292,074	821,656	821,656	144,369,696	555,591	191,643	191,643	31,231,094	189,525	1,013,299	1,013,299	175,600,790	745,116
NATIONAL FORESTS															
Clearwater	195,870	195,870	46,068	149,802	149,802	-	-	52,863	52,863	-	-	202,665	202,665	-	-
St. Joe	300,991	300,991	84,783	216,208	216,208	-	-	84,449	84,449	-	-	300,657	300,657	-	-
Coeur d'Alene	348,092	348,092	33,602	314,490	314,490	-	-	53,829	53,829	-	-	368,319	368,319	-	-
Kaniksu	327,993	327,993	71,727	256,266	256,266	-	-	43,232	43,232	-	-	299,498	299,498	-	-
Cabinet	73,954	73,954	16,469	57,485	57,485	-	-	7,644	7,644	-	-	65,129	65,129	-	-
Kootenai	72,461	72,461	25,680	46,781	46,781	-	-	1,165	1,165	-	-	47,946	47,946	-	-
Subtotal Region 1	1,319,361	1,319,361	278,329	1,041,032	1,041,032	216,877,834	936,961	243,182	243,182	30,968,054	275,139	1,284,214	1,284,214	247,845,888	1,212,100
Region 2	394,000	394,000	357,381	36,619	36,619	1,496,420	13,232	1,962	1,962	86,886	664	38,581	38,581	1,583,306	13,896
Region 4	27,000	27,000	27,000	-	-	-	-	-	-	-	-	-	-	-	-
Total	1,740,361	1,740,361	662,710	1,077,651	1,077,651	218,374,254	950,193	245,144	245,144	31,054,940	275,803	1,322,795	1,322,795	249,429,194	1,225,996

*Indefinite

TABLE 5A

SUMMARY OF ALL OTHER CONTROL WORK, 1918-1942 (INCLUSIVE)

State	Cultivated Black Current Eradication				Nursery Sanitation						
					Number of Nurseries		Number Acres Worked				
	Number Inspections Made	Number Locations Found	Number Black Currants Destroyed	Number 8-Hour Man-Days	Sanitation Zone Maintained	Sanitation Zone Abandoned	Nurseries Maintaining Zones	Nurseries Which Abandoned Zones	Total Acreage	Number Ribes Destroyed	Number 8-Hour Man-Days
Idaho	5,233	2,471	16,553	2,341	-	-	-	-	-	-	-
Montana	1,311	798	5,080	514	1	-	9,391	-	9,391	1,536,723	7,919
Washington	50,050	5,378	78,226	4,218	-	1	-	378	378	20,275	640
Subtotal	56,594	8,647	99,859	7,073	1	1	9,391	378	9,769	1,556,998	8,559
Wyoming	-	-	-	-	1	-	2,038	-	2,038	73,786	567
Total	56,594	8,647	99,859	7,073	2	1	11,429	378	11,807	1,630,784	9,126

State	Mapping Control Areas		Treatment of Infected White Pines			
	Number Acres Mapped (W.P.& Prot. Zones)	Number 8-Hour Man-Days	Total Number Pines Examined	Number Infected Pines Cut Down	Number Infected Pines Treated	Number 8-Hour Man-Days
Idaho	3,338,175	4,603	1,142,708	39,456	969,139	2,933
Montana	259,675	798	70,926	3,812	66,258	1,141
Washington	146,541	342	350,500	2,369	347,436	871
Subtotal	3,744,391	5,743	1,564,134	45,637	1,382,833	4,945
Colorado	206,000	290	-	-	-	-
Wyoming	323,700	351	-	-	-	-
Subtotal	529,700	641	-	-	-	-
Total	4,274,091	6,384	1,564,134	45,637	1,382,833	4,945

TABLE 6A

SUMMARY OF ALL EXPENDITURES, 1918-1942 (INCLUSIVE)

State	Federal (All Agencies Including State WPA Projects)	State (Including All Coop. Funds)		Grand Total (State and Federal Funds)	Recapitulation of Regular Funds			
		Indirect Aid	Direct Aid (Ribes Eradi.)		B.P.I. & B.E.P.Q.	Forest Service	National Parks	Total
Idaho	$10,530,535.94	$225,861.00	$283,033.72	$11,039,430.66	$1,338,835.61	$2,921,679.00	-	$4,260,514.61
Montana	1,029,910.99	109,000.00	-	1,138,910.99	211,572.00	214,810.65	$ 8,755.42	435,138.07
Washington	1,194,368.06	78,000.00	-	1,272,368.06	226,770.96	172,559.42	39,454.73	438,785.11
Subtotal	12,754,814.99	412,861.00	283,033.72	13,450,709.71	1,777,178.57	3,309,049.07	48,210.15	5,134,437.79
Colorado	79,290.00	11,700.00	-	90,990.00	11,852.04	-	-	11,852.04
Wyoming	76,705.65	4,700.00	-	81,405.65	11,314.28	-	-	11,314.28
Subtotal	155,995.65	16,400.00	-	172,395.65	23,166.32	-	-	23,166.32
Total	$12,910,810.64	$429,261.00	$283,033.72	$13,623,105.36	$1,800,344.89	$3,309,049.07	$48,210.15	$5,157,604.11

State	Recapitulation of Emergency Funds										
	Federal W.P.A.			State W.P.A. (All Bureau)	C.C.C. and S.C.S.			P.W.A.			Grand Total
	Bureau	Forest Service	Total		Forest Service and State Camps	Dept. Interior	Total	Bureau	Forest Service	Total	
Idaho	$2,002,140.71	$421,155.19	$2,423,295.90	$14,160.15	$ 992,539.50	-	$ 992,539.50	$470,841.62	$1,369,184.16	$1,840,025.78	$5,270,021.33
Montana	196,847.11	136,851.46	333,698.57	-	18,660.00	$ 4,249.50	22,909.50	88,306.79	149,858.06	238,164.85	594,772.92
Washington	459,112.87	-	459,112.87	854.30	37,057.50	19,038.00	56,095.50	105,199.60	134,320.68	239,520.28	755,582.95
Subtotal	2,658,100.69	558,006.65	4,216,107.34	15,014.45	1,048,257.00	23,287.50	1,071,544.50	664,348.01	1,653,362.90	2,317,710.91	7,620,377.20
Colorado	59,396.51	-	59,396.51	-	-	-	-	8,041.45	-	8,041.45	67,437.96
Wyoming	58,283.96	-	58,283.96	-	-	-	-	7,107.41	-	7,107.41	65,391.37
Subtotal	117,680.47	-	117,680.47	-	-	-	-	15,148.86	-	15,148.86	132,829.33
Total	$2,775,781.16	$558,006.65	$4,333,787.81	$15,014.45	$1,048,257.00	$23,287.50	$1,071,544.50	$679,496.87	$1,653,362.90	$2,332,859.77	$7,753,206.53

III. Cooperative Blister Rust Control on State and Privately-Owned Lands in the Northwestern Region. Work Project BLR-3-4.

Sustained yield of white pine is involved on 1,244,262 acres in state and private ownership which comprises 46 per cent of the commercial white pine area of the Inland Empire. The progress of blister rust control on this acreage is: 821,656 acres initial working; 191,643 acres reeradication; 292,074 acres unworked; and 130,523 acres on a deferred basis. The main control problem is in the state of Idaho where 92 per cent of the acreage is located. In Montana and Washington the state and private white pine lands are in widely scattered small blocks intermingled with federal lands, with the exception of the Mount Spokane area in Washington which contains only 315 acres of federal land out of a total of 19,450 acres.

Cooperative agreements between the Bureau of Entomology and Plant Quarantine and the several states and agencies within the states form the working basis for this blister rust control project. From the start of blister rust work in the Northwest, there has been considerable variation in the type of cooperation. With the exception of the state of Idaho and agencies within Idaho, the cooperation from other states and agencies has been indirect through contributed services by state employees or contributed office and laboratory space. In Idaho, where the great acreage of white pine land in state and private ownership occurs, the state and the Timber Protective Associations in north Idaho began in 1928 to make direct financial contributions for blister rust control on their lands.

Federal participation through the Bureau of Entomology and Plant Quarantine up to July 1, 1942 in the cooperative blister rust control program on state and private lands consisted largely in providing the leadership, coordination, and technical direction for blister rust work within the states along with conducting large scale emergency relief work programs primarily located on state and private lands. New significance was attached to the cooperative program by virtue of the Lea Act, under which authority federal funds were first provided for work on state and private lands in the fiscal year 1942. These funds are allotted to states in amounts equal to the funds contributed directly by the state and private agencies for ribes eradication work.

The cooperative blister rust control work on state and private lands in the Northwestern Region constitutes Work Project BLR-3-4. Also federal funds may be allotted under this project for work on state and private lands intermingled with federal lands.

The state of Idaho and the Clearwater, Potlatch and Priest Lake Timber Protective Associations in Idaho are the only agencies qualifying for federal assistance in the Northwestern Region by virtue of their direct financial contributions. On the basis of a cooperative agreement between the Bureau of Entomology and Plant Quarantine and the state of Idaho, the state receives the funds from the participating Timber Protective Associations and turns them over along with the state funds appropriated for blister rust work for deposit with the U. S. Treasurer to be used by the Bureau of Entomology and Plant Quarantine. The last state biennial appropriation was $38,000 and the

Timber Protective Association contributions for 1941 and 1942 were at the rate of two cents per acre for the total acreage within their respective associations. The Bureau is responsible for the entire direction of the cooperative blister rust project.

In 1942, Work Project BLR-3-4 had three field operations, one on each of the three Timber Protective Associations. Each operation had two camps with a total quota of about 100 workers. Scarcity of labor and the great loss of workers at the start of the season occasioned by heavy rains which prevented working made it impossible to maintain camps at full strength. Nevertheless, the cooperative project about doubled the accomplishments in 1942 as compared with 1941. There were 12,971 acres worked and 1,015,826 ribes destroyed in 1942 as against 7,665 acres worked and 725,072 ribes destroyed in 1941. The increase in 1942 served to make up the greatest part of the loss of WPA and CCC crews on blister rust control.

In the following tables, the progress of ribes eradication on state and private lands is presented. Tables 1 and 3 show the accomplishments in 1942 and for all years under the program financed in part by state and private funds in Idaho. Table 2 shows the number of acres worked on private and state lands in Idaho, Montana and Washington in 1942.

TABLE 1

SUMMARY OF COOPERATIVE RIBES ERADICATION ON STATE AND PRIVATE LANDS IN IDAHO, 1942

Operation	Number Acres Worked					Man-Days	Ribes Destroyed	Per Acre	
	State	Private	National Forest	Public Domain	Total			Man-Days	Ribes
First Working									
Priest Lake	269				269	525	270,882	1.95	1,007
Second Working									
Clearwater		436			436	302	50,202	.69	115
Potlatch	1,260	2,714	2,155	60	6,189	3,537	192,806	.57	31
Priest Lake	2,488	196			2,684	2,053	353,923	.76	132
Total	3,748	3,346	2,155	60	9,309	5,892	596,931	.63	64
Third Working									
Clearwater	294	2,726	120		3,140	3,229	136,289	1.03	43
Priest Lake	98	155			253	124	11,624	.49	46
Total	392	2,881	120		3,393	3,353	147,913	.99	44
Totals - All Workings									
Clearwater	294	3,162	120		3,576	3,531	186,491	.99	52
Potlatch	1,260	2,714	2,155	60	6,189	3,537	192,806	.57	31
Priest Lake	2,855	351			3,206	2,702	636,429	.84	199
Total	4,409	6,227	2,275	60	12,971	9,770	1,015,726	.75	78

TABLE 2

SUMMARY OF RIBES ERADICATION ON STATE AND PRIVATE LANDS, 1942

State	Working	Number of Acres Worked		
		State	Private	Total
Idaho	First	269	90	359
	Second	5,131	6,335	11,466
	Third	624	4,560	5,184
	Total	6,024	10,985	17,009
Montana	Second		76	76
	Third		416	416
	Total		492	492
Total	First	269	90	359
	Second	5,131	6,411	11,542
	Third	624	4,976	5,600
	Total	6,024	11,477	17,501

Note: The additional acres of state and private lands over the number of acres in these ownerships shown in table 1 were intermingled with National Forest lands and were worked by the Forest Service.

TABLE 3

SUMMARY OF COOPERATIVE RIBES ERADICATION
ON STATE AND PRIVATE LANDS IN IDAHO, 1928-1942

Operation	Number Acres Worked	Number Man-Days	Number Ribes Destroyed	Per Acre	
				Man-Days	Ribes
First Working					
Clearwater	24,005	16,862	3,769,434	.70	157
Potlatch	17,073	13,484	3,864,001	.79	226
Priest Lake	111,419	31,454	9,021,759	.28	81
Total	152,497	61,800	16,655,194	.41	109
Second Working					
Clearwater	4,863	3,097	379,652	.64	78
Potlatch	9,329	6,532	361,985	.70	39
Priest Lake	7,639	5,681	807,835	.74	106
Total	21,831	15,310	1,549,472	.70	71
Third Working					
Clearwater	4,313	4,521	244,065	1.05	57
Priest Lake	1,631	1,448	361,706	.89	222
Total	5,944	5,969	605,771	1.00	102
Totals - All Workings					
Clearwater	33,181	24,480	4,393,151	.74	132
Potlatch	26,402	20,016	4,225,986	.76	160
Priest Lake	120,689	38,583	10,191,300	.32	84
Total	180,272	83,079	18,810,437	.46	104

In the following tables, table 4 summarizes the ribes eradication work performed on projects conducted or directly supervised by the Bureau of Entomology and Plant Quarantine and the Bureau of Plant Industry since the start of the program in 1923. This includes the early control work financed by regular federal allotments to the Bureau, the cooperative work on state and private lands, emergency relief work projects financed by PWA and WPA allotments to the Bureau and work performed by crews from S&P-CCC camps. While most of this work was primarily on state and private lands, the intermingled status of ownership resulted in the working of much federal land. The work in Colorado and Wyoming was primarily an experimental control project to test ribes eradication methods and determine control costs in that territory.

Table 5 shows the progress of ribes eradication on state and private lands since the start of the control work according to present ownership. Because of the intermingled ownership of forest land in the Inland Empire, the protection of white pine of any particular ownership can seldom be accomplished without eradicating ribes from adjacent lands of other ownership. Land exchanges and donations of land to the Forest Service have often changed the ownership status from what it was at the time ribes eradication was performed. For these reasons, a summary of ribes eradication performed under individual projects does not give the true picture of the progress of ribes eradication on lands in the particular ownership to which the project was primarily directed. Table 5 presents this information for state and private lands.

TABLE 4

SUMMARY OF ALL RIBES ERADICATION PERFORMED BY THE BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE, 1923-1942

State	Number Acres Worked	Number Man-Days	Number Ribes Destroyed	Per Acre	
				Man-Days	Ribes
First Working					
Idaho	766,247	500,455	125,315,325	.65	164
Montana	65,469	30,728	5,913,038	.47	90
Washington	48,156	46,892	14,422,701	.97	299
Subtotal	879,872	578,075	145,651,064	.66	166
Colorado	14,859	6,292	410,649	.42	28
Wyoming	21,760	6,940	1,085,771	.32	50
Subtotal	36,619	13,232	1,496,420	.36	41
Total	916,491	591,307	147,147,484	.65	161
Second Working					
Idaho	142,694	135,111	24,063,486	.95	169
Montana	1,961	2,577	565,047	1.31	288
Washington	11,920	12,212	2,634,166	1.02	221
Subtotal	156,575	149,900	27,262,699	.96	174
Colorado	1,962	664	86,886	.34	44
Total	158,537	150,564	27,349,585	.95	173
Third Working					
Idaho	19,227	21,673	2,283,597	1.13	119
Montana	648	777	59,040	1.20	91
Washington	4,681	4,036	768,915	.86	164
Total	24,556	26,486	3,111,552	1.08	127
Totals - All Workings					
Idaho	928,168	657,239	151,662,408	.71	163
Montana	68,078	34,082	6,537,125	.50	96
Washington	64,757	63,140	17,825,782	.98	275
Subtotal	1,061,003	754,461	176,025,315	.71	166
Colorado	16,821	6,956	497,535	.41	30
Wyoming	21,760	6,940	1,085,771	.32	50
Subtotal	38,581	13,896	1,583,306	.36	41
Total	1,099,584	768,357	177,608,621	.70	162

TABLE 5

SUMMARY OF RIBES ERADICATION ON STATE AND PRIVATE LANDS, 1923-1942

State	Working	Number of Acres Worked		
		State	Private	Total
Idaho	First	264,018	489,695	753,713
	Second	48,097	98,601	146,698
	Third	7,868	17,149	25,017
	Total	319,983	605,445	925,428
Montana	First	576	20,857	21,433
	Second		2,043	2,043
	Third		1,676	1,676
	Total	576	24,576	25,152
Washington	First	6,832	39,678	46,510
	Second	3,935	7,593	11,528
	Third	2,114	2,567	4,681
	Total	12,881	49,838	62,719
Total	First	271,426	550,230	821,656
	Second	52,032	108,237	160,269
	Third	9,982	21,392	31,374
	Total	333,440	679,859	1,013,299

Statement of funds expended for calendar year 1942 on Work Project BLR-3-4, in Idaho:

Clearwater Timber Protective Association:

Federal	$12,727.51
State	9,865.87
Private	6,000.00
Total	$28,593.38

Potlatch Timber Protective Association:

Federal	$16,689.55
State	3,809.95
Private	5,200.34
Total	$25,699.84

Priest Lake Timber Protective Association:

Federal	$ 9,463.52
State	9,085.86
Private	4,240.44
Total	$22,789.82

Total for Work Project BLR-3-4:

Federal	$38,880.58
State	22,761.68
Private	15,440.78
Total	$77,083.04

Total expenditures from state and private funds on blister rust control in Idaho, 1928-1942:

State	$162,452.91
Private	119,580.81
Total	$282,033.72

Significant progress in control of blister rust on state and private lands has been made. There remain 292,000 acres requiring initial control work. Blister rust infection is generally distributed throughout this area and certain blocks are probably too heavily infected to consider attempting control. The major portion of this unprotected area is lower in priority values and more isolated than areas upon which control work has been started. The present size of the control program is not sufficient to permit an appreciable extension of work into unprotected areas.

For the last several years, it has been necessary to devote the major control effort to completing the protection job on areas where the work has been started. Under the large scale emergency relief work programs, great progress was made in initial control work but with the reduction which took place in these projects starting in 1937, it was not possible to carry through with all the necessary reeradication. The performance of the necessary reeradication will continue to have precedence over an extension of initial work.

One of the most important problems developing upon state and private lands, which has increased by the heavy logging to meet war demands for lumber, is the accumulation of a large acreage of cutover lands within the control area. As a result of logging disturbance, a new crop of white pine and numerous ribes generally start on these cutover areas, which represent the best white pine sites in the region. Ribes seed stored naturally in the ground during the early years of a timber stand's establishment is the source of the comeback of ribes when the stand of timber is removed. If white pine is to be grown on these lands, the ribes must be eradicated which requires at least two workings and in many cases a third working to establish protection. The removal of these ribes in the early period of the ecological succession will be the last eradication job required on these lands, because the ribes would be removed before they matured sufficiently to produce and drop seed.

The present size of the project for controlling blister rust on state and private lands is not adequate to obtain control on the entire acreage, although substantial progress has been made and protection of excellent white pine stands is being accomplished. Since blister rust kills mature white pine very slowly, little damage need be anticipated to white pine now merchantable. For this reason, any increase in the participation of private agencies for the control of blister rust in the younger white pine stands seems unlikely, as the private timber owner sees a relatively short operating life ahead and will neither suffer nor benefit directly by the control of blister rust. As much of the state and private lands are so intermingled with federal lands, ribes must be eradicated from all lands in such instances to protect the white pine on federal lands. Increased federal work on lands of intermingled ownership seems to be the only solution for obtaining control of blister rust on a great portion of the state and private lands. In past years, there has been a significant amount of cutover land supporting a new white pine crop donated to the federal government. If this trend continues, blister rust control on these lands will definitely become a federal responsibility.

IV. Blister Rust Control Operations on National Forests. Financial Project BLR-4.

In the Northwestern Region, blister rust control operations conducted by the Forest Service have been located entirely in Region One within the commercial white pine belt of north Idaho, northwestern Montana and northeastern Washington. This project is handled directly by the Forest Service with the assistance of the Bureau of Entomology and Plant Quarantine which under its responsibilities provides the general leadership, coordination and technical direction for the field work. The Forest Service and the Bureau work together under the provisions of a cooperative agreement between the two agencies.

In Region One, there are 1,393,283 acres of white pine land in Forest Service ownership, which comprises about 52 per cent of the white pine control area in the Inland Empire. The progress of control on this acreage is: 1,041,032 acres initial working; 243,182 acres reeradication; 278,329 acres unworked; and 73,922 acres on a deferred basis.

The Forest Service blister rust control program is organized under the Division of Timber Management, with a forest officer in charge of the field project on each National Forest, who works together with a technical supervisor of the Bureau of Entomology and Plant Quarantine. The program on National Forest lands was administered by the following personnel:

Elers Koch, Assistant Regional Forester in charge of Timber Management
Clearwater National Forest, David Kyle, Assistant Forester
St. Joe National Forest, Donald J. Moore, Assistant Pathologist
Merrill D. Oaks, Principal Agricultural Aid
Coeur d'Alene National Forest, Neal D. Nelson, Assistant Forest Supervisor
Kaniksu National Forest, Frank O. Walters, Associate Pathologist
(Assigned by Bureau of Entomology and Plant Quarantine)
Cabinet and Kootenai National Forests, Charles H. Johnson, Associate Pathologist

The planned program on National Forests for 1942 included 47 camps with a total of 1,500 workers. Early recruitment of workers from colleges and universities throughout the country, together with the employment of all available local residents was initially successful in building up an excellent crew. Adverse weather conditions in June which caused much loss of work time and the great expansion of war activities in the region caused an excessive loss of workers from the project. Some of these were replaced by high school students but it was impossible to keep up with the turnover in workers. The excessive labor turnover greatly handicapped progress of ribes eradication work.

Blister rust crews were given training in fire suppression and were available upon call for fighting forest fires. Although weather conditions were unfavorable to fire, blister rust crews had to be called in several cases. The greatest demand was for crews on the Clearwater National Forest for fighting a serious fire on the Idaho National Forest in Region Four. In 1942, these interruptions in blister rust work to fight fire were somewhat less than in other years.

Table 1 shows the accomplishments for 1942 in ribes eradication by Forest Service crews. Table 2 summarizes the ribes eradication work performed by Forest Service crews since the start of the program. This summary includes the following programs which were administered directly by the Forest Service: Regular, PWA(NIRA), WPA(ERA), and F-CCC. In 1942, all work was performed by regular crews.

TABLE 1

SUMMARY OF RIBES ERADICATION BY THE FOREST SERVICE, 1942

National Forest	Number of Acres Worked					Man-Days	Ribes Destroyed	Per Acre	
	National Forest	Public Domain	State	Private	Total			Man-Days	Ribes
First Working									
Clearwater	1,616			90	1,706	3,903	552,860	2.29	324
St. Joe	50				50	152	5,860	3.04	117
Coeur d'Alene	1,114				1,114	3,005	431,162	2.70	387
Kaniksu	3,234				3,234	4,439	872,127	1.37	270
Cabinet	512				512	1,939	334,213	3.79	653
Total	6,526			90	6,616	13,438	2,196,222	2.03	332
Second Working									
Clearwater	1,638			160	1,798	2,709	955,406	1.51	531
St. Joe	7,227	185	1,383	2,498	11,293	11,010	456,420	.97	40
Coeur d'Alene	1,580			281	1,861	4,139	308,190	2.22	166
Kaniksu	3,997			50	4,047	1,811	181,668	.45	45
Cabinet	880			76	956	1,133	138,295	1.19	145
Total	15,322	185	1,383	3,065	19,955	20,802	2,039,979	1.04	102
Third Working									
St. Joe	2,673	60	232	1,679	4,644	6,269	136,606	1.35	29
Coeur d'Alene	164				164	334	3,066	2.04	19
Kaniksu	1,287				1,287	461	31,465	.36	24
Cabinet	656			416	1,072	683	59,631	.64	56
Total	4,780	60	232	2,095	7,167	7,747	230,768	1.08	32
Totals - All Workings									
Clearwater	3,254			250	3,504	6,612	1,508,266	1.89	430
St. Joe	9,950	245	1,615	4,177	15,987	17,431	598,886	1.09	37
Coeur d'Alene	2,858			281	3,139	7,478	742,418	2.38	237
Kaniksu	8,518			50	8,568	6,711	1,085,260	.78	127
Cabinet	2,048			492	2,540	3,755	532,139	1.49	210
Total	26,628	245	1,615	5,250	33,738	41,987	4,466,969	1.24	132

TABLE 2

SUMMARY OF RIBES ERADICATION BY THE FOREST SERVICE, 1930-1942

National Forest	Number Acres Worked	Number Man-Days	Number Ribes Destroyed	Per Acre	
				Man-Days	Ribes
First Working					
Clearwater	186,594	157,491	47,249,035	.84	253
St. Joe	261,060	272,153	82,014,341	1.04	314
Coeur d'Alene	268,216	301,539	48,524,530	1.12	181
Kaniksu	223,513	137,688	30,173,889	.62	135
Cabinet	40,441	43,243	8,779,912	1.07	217
Kootenai	19,829	13,259	1,662,331	.67	84
Total	999,653	925,373	218,404,038	.93	218
Second Working					
Clearwater	46,243	46,334	6,464,562	1.00	140
St. Joe	84,935	102,597	10,184,553	1.21	120
Coeur d'Alene	48,798	65,492	7,661,607	1.34	157
Kaniksu	39,358	28,991	4,049,115	.74	103
Cabinet	6,067	7,884	728,737	1.30	120
Kootenai	1,271	1,424	118,031	1.12	93
Total	226,672	252,722	29,206,605	1.11	129
Third Working					
Clearwater	3,214	3,237	351,287	1.01	109
St. Joe	15,094	22,633	1,730,276	1.50	115
Coeur d'Alene	9,836	12,609	1,070,647	1.28	109
Kaniksu	2,129	806	124,674	.38	59
Cabinet	2,581	2,798	155,851	1.08	60
Total	32,854	42,083	3,432,735	1.28	104
Totals - All Workings					
Clearwater	236,051	207,062	54,064,884	.88	229
St. Joe	361,089	397,383	93,929,170	1.10	260
Coeur d'Alene	326,850	379,640	57,256,784	1.16	175
Kaniksu	265,000	167,485	34,347,678	.63	130
Cabinet	49,089	53,925	9,664,500	1.10	197
Kootenai	21,100	14,683	1,780,362	.70	84
Total	1,259,179	1,220,178	251,043,378	.97	199

The blister rust control program conducted on National Forest lands is designed to protect the more valuable areas owned by the Forest Service. Actual protection of such lands, because of intermingled ownership, involves the working of other lands. Similarly work on state and private lands, conducted by the Bureau of Entomology and Plant Quarantine involves the working of some federal lands. Since 1939, the acreage in state and private ownership and in public domain worked by the Forest Service has been greater than the National Forest acreage worked by the Bureau. Prior to that time, when the Bureau's program under emergency relief work allotments was larger, the situation was reversed.

Changes in land ownership since ribes eradication work was performed make it necessary to revise annually the tables showing progress of ribes eradication according to present ownership. These changes, primarily donations, have increased the amount of National Forest land in the control area.

Tables 3 and 4, show the amount of National Forest land covered in 1942 and during the period 1923-1942. In 1942, Forest Service crews worked 33,738 acres, while 28,903 acres of National Forest lands were worked. On the other hand for all years, Forest Service crews have worked 1,259,179 acres, but the total acreage of National Forest lands worked is 1,284,214, exclusive of work performed in Colorado and Wyoming.

TABLE 3

PROGRESS OF RIBES ERADICATION ON NATIONAL FOREST LANDS
IN REGION ONE, 1942

National Forest	Number of Acres Worked			
	First	Second	Third	Total
Clearwater	1,616	1,638	120	3,374
St. Joe	50	9,382	2,673	12,105
Coeur d'Alene	1,114	1,580	164	2,858
Kaniksu	3,234	3,997	1,287	8,518
Cabinet	512	880	656	2,048
Total	6,526	17,477	4,900	28,903

TABLE 4

PROGRESS OF RIBES ERADICATION ON NATIONAL FOREST LANDS
IN REGION ONE, 1923-1942

National Forest	Number of Acres Worked				Acres Unworked	Acres Deferred	Acres in Control Area
	First	Second	Third	Totals			
Clearwater	149,802	49,083	3,780	202,665	46,068	8,860	204,730
St. Joe	216,208	74,715	9,734	300,657	84,783	11,089	312,080
Coeur d'Alene	314,490	45,086	8,743	368,319	33,602	10,303	358,395
Kaniksu	256,266	41,208	2,024	299,498	71,727	26,202	354,195
Cabinet	57,485	6,091	1,553	65,129	16,469	3,034	76,988
Kootenai	46,781	1,165		47,946	25,680	14,434	86,895
Total	1,041,032	217,348	25,834	1,284,214	278,329	73,922	1,393,283

Note: 36,619 acres first working; 1,962 acres second working; National Forest lands in Colorado and Wyoming.

Statement of funds expended by the Forest Service for blister rust control work in 1942:

Forest:	Clearwater	St. Joe	Coeur d'Alene	Kaniksu	Cabinet	Total
Amount:	$80,728.80	$179,835.55	$95,946.18	$92,570.31	$39,740.29	$488,821.13

Statement of funds expended by the Forest Service for blister rust control work, not including cost of CCC work, during period 1930-1942:

Forest	Regular	ERA(WPA)	NIRA(PWA)	Total
Clearwater	$ 687,266.34	$ 78,808.87	$ 334,645.93	$1,100,721.14
St. Joe	1,398,945.69	6,983.40	376,356.66	1,782,285.75
Coeur d'Alene	587,062.25	197,410.60	472,399.21	1,256,872.06
Kaniksu	420,964.14	137,952.32	320,103.04	879,019.50
Cabinet	175,734.51	108,618.46	149,858.06	434,211.03
Kootenai	39,076.14	28,233.00	-	67,309.14
Total	$3,309,049.07	$558,006.65	$1,653,362.90	$5,520,418.62

The Forest Service blister rust control project is approaching a basis adequate to obtain control on most of the better white pine areas, although the disruption caused by the labor situation in 1942 was a serious setback. Recently the program has been of sufficient size to permit some initial ribes eradication but most of the work has been directed to completion of control on areas where the work has been started. To what extent white pine areas may have to be abandoned because of heavy blister rust damage depends largely on how much ribes eradication can be accomplished in the next four or five years. Much of the 278,329 acres requiring initial ribes eradication is in isolated blocks of white pine in the more remote areas of the national forests and does not rate as high in priority of control as the areas on which second and third workings are being performed. Probably the chief importance of these isolated blocks is their relation to the reestablishment of a valuable cover within some of the 1910 and 1919 burned-over areas. It is questionable whether control work should be attempted in some of these areas such as the Red Ives district of the St. Joe Forest, and on the Clearwater River Canyon of the Clearwater Forest since the rust has already caused extensive damage to the white pine. In 1942, initial work was started on one of the largest unprotected areas of white pine in the region, known as the Moose City area in the Clearwater Forest.

Up to the present the problem of protecting the new crop of white pine following logging on National Forest lands has not become serious as in the case of such areas on state and private lands. The extent of these cutover areas on federal lands is not as great as in the case of other lands and also the Forest Service blister rust control program has been of sufficient scale to meet the need in most cases as it developed.

Further information on the status of blister rust control on the various national forests is to be found in the individual operation reports.

V. Blister Rust Control on National Parks. Financial Project BLR-5.

In the Northwestern Region, there are five national parks on which blister rust control work has been considered, Mount Rainier, Glacier, Yellowstone, Grand Teton and Rocky Mountain. The Bureau of Entomology and Plant Quarantine, working in cooperation with the National Park Service, has conducted preliminary surveys in these parks for the purpose of delimiting control areas and estimating the costs of protection.

Five-needled pines are widely distributed throughout these national parks. Protection of all the five-needled pine areas would be a very costly undertaking and could not be justified on the basis of values involved. For this reason, the National Park Service has followed the policy of protecting the five-needled pines around the developed and principal scenic and recreational areas where pines comprise a significant part of the forest cover. In addition the protection of two or three larger pine areas to be preserved as specimen areas within some of the parks is planned. Under this policy, there have been only 43,954 acres within the five parks designated for control work.

Control work was started on Mount Rainier in 1930 at which time blister rust infection was already well-established. Under these conditions, adherence to a definite time schedule in completing ribes eradication was necessary to secure protection of the white pine. While this was not done, sufficient work was completed early enough on the Longmire, Silver Forest and White River areas to make control possible even though blister rust infection did appear in serious amounts as control work progressed. In the case of the Stevens-Cowlitz area, the delays in the control program resulted in very heavy blister rust infection and it appears advisable to abandon efforts to protect the white pine in this area. If there is a sufficient survival of the original stocking of white pine, together with the new reproduction which is coming in on portions of the area and which up to the present is quite free from blister rust, completion of control work in the Stevens-Cowlitz area may be considered again at a later date. While this rework is a sizable job, it is relatively small compared to the amount of work already performed.

In Glacier National Park, control work was started in 1939. While blister rust infection has been found on ribes throughout the park, only a few blister rust cankers have been found on the pine, all in the Lake MacDonald control area. Work was initiated sufficiently early in Glacier, providing it is completed within three or four years, to obtain and maintain protection of the selected pine areas without difficulty. With blister rust infection in the park, the time is not far off when intensification of the rust may take place where ribes have not been eradicated. Under such conditions, the cost of obtaining control is greatly increased.

In 1942, ribes eradication was continued on Mount Rainier and Glacier, the only parks in the Northwestern Region on which work has been started, with one camp of about 35 workers on each park. Technical direction of the field work was given by a representative from the Bureau of Entomology and Plant Quarantine who trained the foremen and assisted in the training of the crew, checked the efficiency of the work and established work boundaries.

Summaries of the work performed in 1942 are shown in table 1 and the progress for all years in table 2.

TABLE 1

SUMMARY OF RIBES ERADICATION ON NATIONAL PARKS, 1942

National Park	Working	Acres Worked	Man-Days	Ribes Destroyed	Per Acre	
					Man-Days	Ribes
Mount Rainier	Second	71	174	2,714	2.45	38
	Third	2,133	997	11,076	.47	5
	Total	2,204	1,171	13,790	.53	6
Glacier	First	262	301	37,155	1.15	142
	Second	731	763	122,606	1.04	168
	Total	993	1,064	159,761	1.07	161
Total	First	262	301	37,155	1.15	142
	Second	802	937	125,320	1.17	156
	Third	2,133	997	11,076	.47	5
	Total	3,197	2,235	173,551	.70	54

TABLE 2

SUMMARY OF RIBES ERADICATION ON NATIONAL PARKS, 1930-1942

National Park	Working	Acres Worked	Man-Days	Ribes Destroyed	Per Acre	
					Man-Days	Ribes
Mount Rainier	First	8,254	10,070	1,640,507	1.22	199
	Second	5,028	5,941	400,913	1.18	80
	Third	3,944	2,909	94,224	.74	24
	Total	17,226	18,920	2,135,644	1.10	124
Glacier	First	2,895	3,134	360,996	1.08	125
	Second	731	763	122,606	1.04	168
	Total	3,626	3,897	483,602	1.07	133
Total	First	11,149	13,204	2,001,503	1.18	180
	Second	5,759	6,704	523,519	1.16	91
	Third	3,944	2,909	94,224	.74	24
	Total	20,852	22,817	2,619,246	1.09	126

Table 3 shows the status of control work on the national parks in the Northwestern Region. The control area designated for Glacier, Yellowstone and Grand Teton is based on intensive surveys, but a final decision has not been made by the Park Service as to the areas which will be protected. In the case of Glacier and Grand Teton the acreage listed probably represents the maximum which might be included, for Yellowstone, final plans may include a greater acreage. For Rocky Mountain, the acreage is only an estimate based on an extensive survey.

TABLE 3

STATUS OF CONTROL ON NATIONAL PARKS

National Park	Acres in Control Area	Number Acres Worked			Acres Unworked
		First	Second	Third	
Mount Rainier	8,254	8,254	5,028	3,944	
Glacier	10,000	2,895	731		7,105
Yellowstone	12,900				12,900
Grand Teton	5,800				5,800
Rocky Mountain	7,000				7,000
Total	43,954	11,149	5,759	3,944	32,805

Statement of funds expended by the National Park Service for blister rust control work in 1942:

National Park	Regular Funds
Mount Rainier	$ 8,328.73
Glacier	8,755.42
Total	$17,084.15

Statement of funds expended by the National Park Service for blister rust control work, not including cost of CCC work, during period 1930-1942:

National Park	Regular Funds
Mount Rainier	$39,454.73
Glacier	8,755.42
Total	$48,210.15

Conditions in national parks are very favorable for development of white pine blister rust. Occurrence of fog and high winds in the high elevations is an excellent medium by which the rust spreads between its hosts, ribes and pine. The continuance of this condition together with long periods of suitable temperatures results in longer distances of spread and rapid intensification of the rust once it is established. The principal species on some of the control areas are Pinus albicaulis and P. flexilis which are very susceptible and in most of the parks either Ribes petiolare or R. bracteosum, two highly susceptible species of ribes, is present.

Not only are conditions in the parks ideal for the rust, but the eradication of ribes is also difficult because of much steep and rough topography and because hand grubbing must be used almost entirely, without resorting to chemical and bulldozer methods for eradicating heavy concentrations of ribes where these methods could be employed.

For these reasons, control work must be started and completed well in advance of any serious establishment of blister rust, if protection of the white pine is to be secured.

BLISTER RUST CONTROL, INLAND EMPIRE, 1942

By
Herman E. Swanson
Senior Pathologist

This report summarizes the progress of blister rust control work on the commercial white pine area of the Inland Empire by consolidating the following operation reports:

1. Clearwater Operation
2. St. Joe Operation
3. Coeur d'Alene Operation
4. Kaniksu Operation
5. Montana Operation (Cabinet and Kootenai)
6. Mount Spokane Operation (no work performed in 1942)

The 1942 program included 34 Forest Service camps with approximately 1,464 workers for work on National Forest lands and 7 cooperative camps with approximately 290 workers administered by the Bureau of Entomology and Plant Quarantine for work on state and private lands. This was the first year since 1933 that no CCC or WPA crews were engaged on ribes eradication work. Progress of control work in 1942 was greatly retarded due to a critical labor shortage, with the result that only 46,709 acres were worked in the Inland Empire area.

A change was made in presenting data by eradication types in order to show the amount of work performed in newly established white pine reproduction. Age of the stand has a very important bearing on the control problem, particularly in the very young white pine. For this reason, future records will show ribes eradication work performed on areas burned or logged in each 10-year period starting with 1940. As protection is gradually being completed in the older reproduction and pole stands, future control work will become more and more confined to the protection of new white pine on cutover lands.

To reduce the size of the 1942 tabulations, certain data were combined. Data for open and dense type classifications within the same age class were combined. Information on density is still retained in the permanent record maps. Work performed under the NIRA (PWA) and ERA (WPA) programs was combined under one emergency relief work category. Similarly F-CCC and S-CCC work was combined under one heading of CCC. Since no blister rust work was performed by ERA or CCC crews in 1942, the 1941 annual report provides the permanent record of work performed under each of the emergency relief work programs.

Designations used in this report:

EQ	-Bureau of Entomology and Plant Quarantine
FS	-Forest Service
Reg.	-Program on regular appropriations
CCC	-Civilian Conservation Corps (F-CCC and S-CCC)
Emerg.	-Combines emergency relief work - NIRA (PWA) and ERA (WPA)
EQ-Coop.	-Cooperative program on state and private lands, financed by Bureau, State of Idaho, and Idaho Timber Protective Associations.

STATEMENT OF EXPENDITURES AND COSTS

The following tables show the expenditures made on the ribes eradication program. Effective man-day costs were exceptionally high in 1942 as a result of higher wages, high labor turnover and a great loss in work time caused by rain.

TABLE 1

EXPENDITURES BY APPROPRIATIONS IN INLAND EMPIRE, 1942

Cooperating Agency	Appropriation	Amount
Bureau of Entomology and Plant Quarantine	Regular BLR-1-4	$ 33,615.45
	Regular BLR-3-4	38,880.58
	Subtotal	72,496.03
State of Idaho Timber Protective Associations	State BLR-3-4	22,761.68
	Private BLR-3-4	15,440.78
	Subtotal	38,202.46
Forest Service	Regular BLR-4	488,821.13
Total		$599,519.62

TABLE 2

CLASSIFIED EXPENDITURES IN INLAND EMPIRE, 1942

Item	Bureau of Entomology and Plant Quarantine				Forest Service	
	Regular BLR-1-4	Regular BLR-3-4	State and Private BLR-3-4	Total	Regular BLR-4	Total
Sal. perm. men	$25,086.02			$ 25,086.02	$ 20,741.71	$ 45,827.7
Sal. temp. men	896.40	$ 5,624.37	$ 3,350.93	9,871.70	37,519.61	47,391.3
Wages, temp. labs.	2,080.93	21,620.07	34,773.49	58,474.49	316,031.87	374,506,3
Subs. supplies	1,170.89	10,180.47	78.04	11,429.40	88,997.53	100,426.9
Equipment	40.89	3.18		44.07	13,936.22	13,980.2
Travel & transp.	1,398.65	953.41		2,352.06	5,205.56	7,557.6
Chemicals					362.60	362.6
Twine					1,972.08	1,972.0
Other supplies	2,941.67	499.08		3,440.75	4,053.95	7,494.7
Total	$33,615.45	$38,880.58	$38,202.46	$110,698.49	$488,821.13	$599,519.6

TABLE 2A

DISTRIBUTION OF EXPENDITURES BY PROJECTS IN INLAND EMPIRE, 1942

Project	Expenditures	Number Effective Man-Days	Effective Man-Day Cost
Planning, Coordination and Technical Direction			
BEPQ Regular BLR-1-4	$ 33,615.45		
Cooperative - State and Private Lands			
BEPQ Regular BLR-3-4	38,880.58		
State of Idaho BLR-3-4	22,761.68	9,770	$ 7.89
Timber Protective Associations BLR-3-4	15,440.78		
Total	77,083.04		
National Forest Lands			
Forest Service Regular BLR-4	$488,821.13	41,987	$11.64

	Bureau	Forest Service
Number meals served	57,278	259,717
Average cost per meal	$0.227	$0.319
Pounds of twine	2,184	7,065
Pounds of chemical		32,071

SUMMARY OF RIBES ERADICATION, 1942
INLAND EMPIRE

TABLE 3 - SUMMARY OF ALL WORKINGS

Eradication Type	Acres First Working	Acres Second Working	Acres Third Working	Total Acres	Effective Man-Days	Total Ribes	Total Gallons Spray
Cutover (1940-1942)		211	54	265	189	14,002	
Burn (1940-1942)		60		60	232	134,749	
Cutover (Prior 1940)	222	5,462	3,022	8,706	8,927	1,618,810	
Burn (Prior 1940)	270	782		1,052	3,149	475,315	
Reproduction	4,185	9,940	4,622	18,747	22,915	1,704,643	
Pole	1,527	11,130	1,541	14,198	10,829	878,404	
Mature	116	757		873	313	42,741	
Brush		92	115	207	76	2,312	
Subalpine		60		60	12	12,019	
All Upland	6,320	28,494	9,354	44,168	46,642	4,882,995	
Stream (Hand)	401	437	1,206	2,044	2,535	409,030	
Stream (Chemical)	378	119	133	630	894	71,835	23,945
Stream (Zone)	164	333		497	1,686	118,835	
All Stream	565	770	1,206	2,541	5,115	599,700	
All Types	6,885	29,264	10,560	46,709	51,757	5,482,695	

TABLE 3A - FIRST WORKING

Eradication Type	Acres	Effective Man-Days	Total Ribes	Gallons Spray	Per Acre Basis: Man-Days	Ribes	Gallons Spray
Cutover (Prior 1940)	222	452	256,746		2.04	1,157	
Burn (Prior 1940)	270	1,046	274,709		3.87	1,017	
Reproduction	4,185	6,984	1,150,768		1.67	275	
Pole	1,527	2,510	335,611		1.64	220	
Mature	116	36	2,758		.31	24	
All Upland	6,320	11,028	2,020,592		1.74	320	
Stream (Hand)	401	1,199	297,106		2.99	741	
Stream (Chemical)	378	691	63,837	21,279	1.83	169	56
Stream (Zone)	164	1,045	85,569		6.37	522	
All Stream	565	2,935	446,512		5.19	790	
All Types	6,885	13,963	2,467,104		2.03	358	

TABLE 3B - SECOND WORKING

Cutover (1940-1942)	211	147	6,191		.70	29	
Burn (1940-1942)	60	232	134,749		3.87	2,246	
Cutover (Prior 1940)	5,462	5,369	1,232,245		.98	226	
Burn (Prior 1940)	782	2,103	200,606		2.69	257	
Reproduction	9,940	9,707	407,733		.98	41	
Pole	11,130	7,426	513,214		.67	46	
Mature	757	277	39,983		.37	53	
Brush	92	13	544		.14	6	
Subalpine	60	12	12,019		.20	200	
All Upland	28,494	25,286	2,547,284		.89	89	
Stream (Hand)	437	622	51,242		1.42	117	
Stream (Chemical)	119	145	5,118	1,706	1.22	43	14
Stream (Zone)	333	641	33,266		1.92	100	
All Stream	770	1,408	89,626		1.83	116	
All Types	29,264	26,694	2,636,910		.91	90	

TABLE 3C - THIRD WORKING

Cutover (1940-1942)	54	42	7,811		.78	145	
Cutover (Prior 1940)	3,022	3,106	129,819		1.03	43	
Reproduction	4,622	6,224	146,142		1.35	32	
Pole	1,541	893	29,579		.58	19	
Brush	115	63	1,768		.55	15	
All Upland	9,354	10,328	315,119		1.10	34	
Stream (Hand)	1,206	714	60,682		.59	50	
Stream (Chemical)	133	58	2,880	960	.44	22	7
All Stream	1,206	772	63,562		.64	53	
All Types	10,560	11,100	378,681		1.05	36	

TABLE 4

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1942
INLAND EMPIRE

State	Working	Class	Acres	Effective Man-Days	Total Ribes	Gallons Spray	Per Acre Basis Man-Days	Per Acre Basis Ribes
Idaho	First	EC-Coop.	269	525	270,982		1.95	1,007
		FS-Reg.	4,717	9,174	1,177,252	21,279	1.94	250
		Total	4,986	9,699	1,448,134	21,279	1.95	290
	Second	EC-Coop.	9,309	5,892	596,931		.63	64
		FS-Reg.	18,201	19,240	1,871,114	1,106	1.06	103
		Total	27,510	25,132	2,468,045	1,106	.91	90
	Third	EC-Coop.	3,393	3,353	147,913		.99	44
		FS-Reg.	6,095	7,064	171,137	960	1.16	28
		Total	9,488	10,417	319,050	960	1.10	34
	All Workings	EC-Coop.	12,971	9,770	1,015,725		.75	78
		FS-Reg.	29,013	35,478	3,219,503	23,345	1.22	111
		Total	41,984	45,248	4,235,229	23,345	1.08	101
Washington	First	FS-Reg.	1,387	2,325	684,757		1.68	494
	Second	FS-Reg.	798	429	30,570		.54	38
	All Workings	FS-Reg.	2,185	2,754	715,327		1.26	327
Montana	First	FS-Reg.	512	1,939	334,213		3.79	653
	Second	FS-Reg.	956	1,133	138,295	600	1.19	145
	Third	FS-Reg.	1,072	683	59,631		.64	56
	All Workings	FS-Reg.	2,540	3,755	532,139	600	1.48	210
Total	First	EC-Coop.	269	525	270,882		1.95	1,007
		FS-Reg.	6,616	13,438	2,196,222	21,279	2.03	332
		Total	6,985	13,963	2,467,104	21,279	2.03	353
	Second	EC-Coop.	9,309	5,892	596,931		.63	64
		FS-Reg.	19,955	20,802	2,039,979	1,706	1.04	102
		Total	29,264	26,694	2,636,910	1,706	.91	90
	Third	EC-Coop.	3,393	3,353	147,913		.99	44
		FS-Reg.	7,167	7,747	230,768	960	1.08	32
		Total	10,560	11,100	378,681	960	1.05	36
	All Workings	EC-Coop	12,971	9,770	1,015,726		.75	78
		FS-Reg.	33,738	41,987	4,466,969	23,945	1.24	132
		Total	46,709	51,757	5,482,695	23,945	1.11	117

TABLE 5

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1942
INLAND EMPIRE

State	Working	Number of Acres Worked																
		By Forest Service					By Bureau of Entomology and Plant Quarantine					Total						
												Federal			Other			
		National Forest	Public Domain	State	Private	Total	National Forest	Public Domain	State	Private	Total	National Forest	Public Domain	Total	State	Private	Total	Total
Idaho	First	4,627			90	4,717			269		269	4,627		4,627	269	90	359	4,986
	Second	13,644	185	1,383	2,989	19,201	2,155	60	3,748	3,346	9,309	15,799	245	16,044	5,131	6,335	11,466	27,510
	Third	4,124	60	232	1,679	6,095	120		392	2,991	3,393	4,244	60	4,304	624	4,560	5,184	9,488
	Total	22,395	245	1,615	4,758	29,013	2,275	60	4,409	6,227	12,971	24,670	305	24,975	6,024	10,985	17,009	41,984
Washington	First	1,387				1,387						1,387		1,387				1,387
	Second	798				798						798		798				798
	Total	2,185				2,185						2,185		2,185				2,185
Montana	First	512				512						512		512				512
	Second	880			76	956						880		880		76	76	956
	Third	656			416	1,072						656		656		416	416	1,072
	Total	2,048			492	2,540						2,048		2,048		492	492	2,540
Total	First	6,526			90	6,616			269		269	6,526		6,526	269	90	359	6,885
	Second	15,322	185	1,383	3,065	19,955	2,155	60	3,748	3,346	9,309	17,477	245	17,722	5,131	6,411	11,542	29,264
	Third	4,780	60	232	2,095	7,167	120		392	2,991	3,393	4,900	60	4,960	624	4,976	5,600	10,560
	Total	26,628	245	1,615	5,250	33,738	2,275	60	4,409	6,227	12,971	28,903	305	29,208	6,024	11,477	17,501	46,709

TABLE 6

TOTAL RIBES BY SPECIES ERADICATED, 1942
INLAND EMPIRE

Working	Eradication Type	Acres	Ribes by Species						Total Ribes
			Ribes lacustre	Ribes viscosissimum	Ribes petiolare	Ribes inerme	Ribes irriguum	Ribes triste	
First	Cutover (Prior 1940)	222	42,853	213,893					256,746
	Burn (Prior 1940)	270	216,466	58,243					274,709
	Reproduction	4,185	416,676	734,076	14	2			1,150,768
	Pole	1,527	179,595	156,016					335,611
	Mature	116	2,642	116					2,758
	All Upland	6,320	858,232	1,162,344	14	2			2,020,592
	Stream	565	370,353	2,465	63,837	9,857			446,512
	All Types	6,885	1,228,585	1,164,809	63,851	9,859			2,467,104
Second	Cutover (1940-1942)	211	4,089	2,102					6,191
	Burn (1940-1942)	60	32,168	102,581					134,749
	Cutover (Prior 1940)	5,462	349,981	876,713	860	312	4,379		1,232,245
	Burn (Prior 1940)	782	148,580	52,026					200,606
	Reproduction	9,940	263,579	131,517	465	7,172			407,733
	Pole	11,130	203,099	306,164	2,740	1,211			513,214
	Mature	757	16,401	23,582					39,983
	Brush	92	529	15					544
	Subalpine	60	8,124	3,895					12,019
	All Upland	28,494	1,031,550	1,498,595	4,065	8,695	4,379		2,547,284
	Stream	770	60,159	4,769	9,876	13,552		1,270	89,626
	All Types	29,264	1,091,709	1,503,364	13,941	22,247	4,379	1,270	2,636,910
Third	Cutover (1940-1942)	54	6,219	1,592					7,811
	Cutover (Prior 1940)	3,022	41,758	82,754	5,307				129,819
	Reproduction	4,622	89,721	54,300	660	1,347		114	146,142
	Pole	1,541	11,604	17,830	4	141			29,579
	Brush	115	718	1,026		24			1,768
	All Upland	9,354	150,020	157,502	5,971	1,512		114	315,119
	Stream	1,206	24,072	379	28,163	2,296		8,652	63,562
	All Types	10,560	174,092	157,881	34,134	3,808		8,766	378,681
All Workings	Cutover (1940-1942)	265	10,308	3,694					14,002
	Burn (1940-1942)	60	32,168	102,581					134,749
	Cutover (Prior 1940)	8,706	434,592	1,173,360	6,167	312	4,379		1,618,810
	Burn (Prior 1940)	1,052	365,046	110,269					475,315
	Reproduction	18,747	774,976	919,893	1,139	8,521		114	1,704,643
	Pole	14,198	394,298	480,010	2,744	1,352			878,404
	Mature	873	19,043	23,698					42,741
	Brush	207	1,247	1,041		24			2,312
	Subalpine	60	8,124	3,895					12,019
	All Upland	44,169	2,039,802	2,818,441	10,050	10,209	4,379	114	4,882,995
	Stream	2,541	454,584	7,613	101,876	25,705		9,922	599,700
	All Types	46,709	2,494,386	2,826,054	111,926	35,914	4,379	10,036	5,482,695

SUMMARY OF RIBES ERADICATION, 1923-1942
INLAND EMPIRE

TABLE 7 - SUMMARY OF ALL WORKINGS

Eradication Type	Acres First Working	Acres Second Working	Acres Third Working	Total Acres	Effective Man-Days	Total Ribes	Gallons Spray
Cutover (1940-1942)		211	54	265	189	14,002	
Burn (1940-1942)		60		60	232	134,749	
Cutover (Prior 1940)	49,539	48,648	13,452	111,639	121,486	33,545,840	
Burn (Prior 1940)	8,181	1,613		9,794	10,770	3,842,819	
Reproduction	589,592	157,908	22,870	770,370	873,691	202,763,452	
Pole	356,064	76,376	5,353	437,793	198,620	32,569,399	
Mature	722,397	44,061	2,258	768,716	337,615	70,963,640	
Brush	25,041	2,354	459	27,854	27,080	5,105,948	
Subalpine	3,255	291	88	3,634	2,363	491,592	
Meadow-Field	2,569	10		2,579	152	12,203	
All Upland	1,756,638	331,532	44,534	2,132,704	1,572,198	349,443,644	
Stream (Hand)	118,832	47,084	12,876	178,792	296,542	69,331,314	
Stream (Chemical)	22,916	9,238	1,249	33,403	68,657	5,436,083	1,781,156
Stream (Mechanical)	3,728	155	40	3,923	32,298	2,231,390	
Stream (Zone)	372	4,476		4,848	4,954	626,262	
All Stream	122,887	51,715	12,876	187,478	402,441	77,625,049	
All Types	1,879,525	383,247	57,410	2,320,182	1,974,639	427,068,693	

TABLE 7A - FIRST WORKING

Eradication Type	Acres	Effective Man-Days	Total Ribes	Gallons Spray	Per Acre Basis: Man-Days	Per Acre Basis: Ribes	Per Acre Basis: Gallons Spray
Cutover (Prior 1940)	49,539	48,569	16,815,656		.98	339	
Burn (Prior 1940)	8,181	7,156	2,894,183		.87	354	
Reproduction	589,592	656,206	180,055,529		1.11	305	
Pole	356,064	151,308	27,829,698		.42	78	
Mature	722,397	307,774	67,217,507		.43	93	
Brush	25,041	24,565	4,856,832		.98	194	
Subalpine	3,255	2,170	463,787		.67	142	
Meadow-Field	2,569	151	12,131		.06	5	
All Upland	1,756,638	1,197,899	300,145,323		.69	171	
Stream (Hand)	118,832	219,456	56,981,669		1.85	480	
Stream (Chemical)	22,916	54,386	4,639,290	1,515,495	2.37	202	66
Stream (Mechanical)	3,728	30,392	2,147,593		8.15	576	
Stream (Zone)	372	1,315	141,227		3.53	380	
All Stream	122,887	305,549	63,909,779		2.49	520	
All Types	1,879,525	1,503,448	364,055,102		.80	194	

TABLE 7B - SECOND WORKING

Cutover (1940-1942)	211	147	6,191		.70	29	
Burn (1940-1942)	60	232	134,749		3.87	2,246	
Cutover (Prior 1940)	48,648	56,268	15,109,092		1.16	311	
Burn (Prior 1940)	1,613	3,614	948,636		2.24	588	
Reproduction	157,908	188,119	20,525,504		1.19	130	
Pole	76,376	43,688	4,360,319		.57	57	
Mature	44,061	28,309	3,542,293		.64	80	
Brush	2,354	2,226	228,442		.95	97	
Subalpine	291	154	22,457		.53	77	
Meadow-Field	10	1	72		.10	7	
All Upland	331,532	322,758	44,877,755		.97	135	
Stream (Hand)	47,084	61,765	10,317,228		1.31	219	
Stream (Chemical)	9,238	13,206	725,492	241,894	1.43	79	26
Stream (Mechanical)	155	1,254	63,794		8.09	412	
Stream (Zone)	4,476	3,639	485,035		.81	108	
All Stream	51,715	79,864	11,591,549		1.54	224	
All Types	383,247	402,622	56,469,304		1.05	147	

TABLE 7C - THIRD WORKING

Cutover (1940-1942)	54	42	7,811		.78	145	
Cutover (Prior 1940)	13,452	16,649	1,621,092		1.24	121	
Reproduction	22,870	29,366	2,182,419		1.28	95	
Pole	5,353	3,624	379,382		.68	71	
Mature	2,258	1,532	203,840		.68	90	
Brush	459	289	20,674		.63	45	
Subalpine	88	39	5,348		.44	61	
All Upland	44,534	51,541	4,420,566		1.16	99	
Stream (Hand)	12,876	15,321	2,032,420		1.19	158	
Stream (Chemical)	1,249	1,065	71,301	23,767	.85	57	19
Stream (Mechanical)	40	642	20,000		16.05	500	
All Stream	12,876	17,028	2,123,721		1.32	165	
All Types	57,410	68,569	6,544,287		1.19	114	

TABLE 8

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1923-1942
INLAND EMPIRE

State	Working	Class	Acres	Effective Man-Days	Total Ribes	Gallons Spray	Per Acre Basis	
							Man-Days	Ribes
Idaho	First	EQ-Reg.	48,984	20,468	5,042,300	79,864	.42	103
		EQ-Coop.	152,497	61,800	16,655,194	175,594	.41	109
		EQ-Emerg.	397,953	290,528	77,495,446	152,489	.73	195
		FS-Reg.	215,961	213,050	58,085,523	385,805	.99	269
		FS-Emerg.	305,020	194,845	54,142,291	113,170	.64	178
		CCC	517,106	540,911	109,366,841	550,759	1.05	211
		Total	1,637,521	1,321,602	320,787,595	1,457,690	.81	196
	Second	EQ-Coop.	21,831	15,310	1,549,472	11,079	.70	71
		EQ-Emerg.	104,562	98,803	17,869,395	56,311	.94	171
		FS-Reg.	125,938	127,988	15,874,698	51,771	1.02	126
		FS-Emerg.	31,164	20,079	2,298,195	10,051	.64	74
		CCC	65,117	106,410	13,052,710	101,537	1.63	200
		Total	348,612	368,590	50,644,450	230,748	1.06	145
	Third	EQ-Coop.	5,944	5,969	605,771		1.00	102
		EQ-Emerg.	12,427	14,769	1,509,738	5,135	1.19	121
		FS-Reg.	20,620	24,316	1,863,719	7,809	1.18	90
		FS-Emerg.	1,695	1,316	196,299	2,270	.79	116
		CCC	8,191	14,372	1,309,689	5,008	1.75	160
		Total	48,867	60,742	5,485,216	20,222	1.24	112
	All Workings	EQ-Reg.	48,984	20,468	5,042,300	79,864	.42	103
		EQ-Coop.	180,272	83,079	18,810,437	186,662	.46	104
		EQ-Emerg.	514,942	404,100	96,874,569	213,935	.78	188
		FS-Reg.	362,519	365,354	75,823,940	445,385	1.01	209
		FS-Emerg.	337,869	216,240	56,636,775	125,491	.64	168
		CCC	590,414	661,693	123,729,240	657,303	1.12	210
		Total	2,035,000	1,750,934	376,917,261	1,708,640	.86	185
Washington	First	EQ-Emerg.	48,156	46,892	14,422,701		.97	299
		FS-Reg.	13,951	13,590	5,376,625		.97	385
		FS-Emerg.	34,417	12,708	3,858,496		.37	112
		CCC	19,741	21,426	3,254,404		1.09	165
		Total	116,265	94,616	26,912,226		.81	231
	Second	EQ-Emerg.	11,920	12,212	2,634,166		1.02	221
		FS-Reg.	8,880	4,978	1,391,280		.56	157
		FS-Emerg.	1,949	1,678	154,764		.86	79
		CCC	2,587	3,279	232,829		1.27	90
		Total	25,336	22,147	4,413,039		.87	174
	Third	EQ-Emerg.	4,681	4,036	768,915		.86	164
		FS-Reg.	633	216	75,265		.34	119
		Total	5,314	4,252	844,180		.80	159
	All Workings	EQ-Emerg.	64,757	63,140	17,825,782		.98	275
		FS-Reg.	23,464	18,784	6,843,170		.80	292
		FS-Emerg.	36,366	14,386	4,013,260		.40	110
		CCC	22,328	24,705	3,487,233		1.11	156
		Total	146,915	121,015	32,169,445		.82	219
Montana	First	EQ-Reg.	1,393	2,315	462,300	30,665	1.67	334
		EQ-Emerg.	64,086	28,413	5,450,738	1,330	.44	85
		FS-Reg.	13,036	13,331	1,987,742	2,452	1.02	152
		FS-Emerg.	33,462	33,088	7,157,633	20,598	.99	214
		CCC	13,772	10,083	1,296,868	2,780	.73	94
		Total	125,739	87,230	16,355,281	57,825	.69	130
	Second	EQ-Reg.	619	980	299,410	4,130	1.58	484
		EQ-Emerg.	1,342	1,597	265,637		1.19	198
		FS-Reg.	4,560	4,670	479,320	5,976	1.02	105
		FS-Emerg.	2,100	2,464	204,021	1,040	1.17	97
		CCC	678	2,174	163,427		3.21	241
		Total	9,299	11,885	1,411,815	11,146	1.28	152
	Third	EQ-Emerg.	648	777	59,040		1.20	91
		FS-Reg.	2,406	2,547	138,068		1.06	57
		FS-Emerg.	150	68	6,069		.45	40
		CCC	25	183	11,714	3,545	7.32	469
		Total	3,229	3,575	214,891	3,545	1.11	67
	All Workings	EQ-Reg.	2,002	3,295	761,710	34,795	1.65	380
		EQ-Emerg.	66,076	30,787	5,775,415	1,330	.47	87
		FS-Reg.	20,002	20,548	2,605,130	8,428	1.03	130
		FS-Emerg.	35,712	35,620	7,367,723	21,638	1.00	206
		CCC	14,475	12,440	1,472,009	6,325	.86	102
		Total	138,267	102,690	17,991,987	72,516	.74	130
Idaho Washington Montana	First	EQ-Reg.	50,367	22,783	5,504,600	110,529	.45	109
		EQ-Coop.	152,497	61,800	16,655,194	175,594	.41	109
		EQ-Emerg.	510,195	365,833	97,368,885	153,819	.72	191
		FS-Reg.	242,948	239,971	65,449,890	388,257	.99	269
		FS-Emerg.	372,899	240,641	65,158,420	133,768	.65	175
		CCC	550,619	572,420	113,918,113	553,538	1.04	207
		Total	1,879,525	1,503,448	364,055,102	1,515,495	.80	194
	Second	EQ-Reg.	619	980	299,410	4,130	1.58	484
		EQ-Coop.	21,831	15,310	1,549,472	11,078	.70	71
		EQ-Emerg.	117,824	112,612	20,769,188	56,311	.96	176
		FS-Reg.	139,378	137,636	17,745,298	57,747	.99	127
		FS-Emerg.	35,213	24,221	2,656,970	11,091	.69	75
		CCC	68,382	111,863	13,448,966	101,537	1.64	197
		Total	383,247	402,622	56,469,304	241,894	1.05	147
	Third	EQ-Coop.	5,944	5,969	605,771		1.00	102
		EQ-Emerg.	17,756	19,582	2,337,693	5,135	1.10	132
		FS-Reg.	23,659	27,079	2,077,052	7,809	1.14	88
		FS-Emerg.	1,835	1,384	202,368	2,270	.75	110
		CCC	8,216	14,555	1,321,403	8,553	1.77	161
		Total	57,410	68,569	6,544,287	23,767	1.19	114
	All Workings	EQ-Reg.	50,986	23,763	5,804,010	114,659	.47	114
		EQ-Coop.	180,272	83,079	18,810,437	186,662	.46	104
		EQ-Emerg.	645,775	498,027	120,475,766	215,265	.77	187
		FS-Reg.	405,985	404,686	85,272,240	453,813	1.00	211
		FS-Emerg.	409,947	266,246	68,017,758	147,129	.65	166
		CCC	627,217	698,838	128,688,482	663,628	1.11	205
		Total	2,320,182	1,974,639	427,068,693	1,791,156	.85	184

TABLE 9

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1923-1942
INLAND EMPIRE

State	Working	Number of Acres Worked						
		Federal			Other			
		National Forest	Public Domain	Total	State	Private	Total	Total
Idaho	First	867,326	16,492	883,808	264,018	489,695	753,713	1,637,521
	Second	196,344	5,570	201,914	48,097	98,601	146,698	348,612
	Third	23,648	202	23,850	7,868	17,149	25,017	48,867
	Total	1,087,318	22,254	1,109,572	319,983	605,445	925,428	2,035,000
Washington	First	69,440	315	69,755	6,832	39,678	46,510	116,265
	Second	13,748	60	13,808	3,935	7,593	11,528	25,336
	Third	633		633	2,114	2,567	4,681	5,314
	Total	83,821	375	84,196	12,881	49,838	62,719	146,915
Montana	First	104,266	40	104,306	576	20,857	21,433	125,739
	Second	7,256		7,256		2,043	2,043	9,299
	Third	1,553		1,553		1,676	1,676	3,229
	Total	113,075	40	113,115	576	24,576	25,152	138,267
Total	First	1,041,032	16,837	1,057,869	271,426	550,230	821,656	1,879,525
	Second	217,348	5,630	222,978	52,032	108,237	160,269	383,247
	Third	25,834	202	26,036	9,982	21,392	31,374	57,410
	Total	1,284,214	22,669	1,306,883	333,440	679,859	1,013,299	2,320,182

TABLE 10

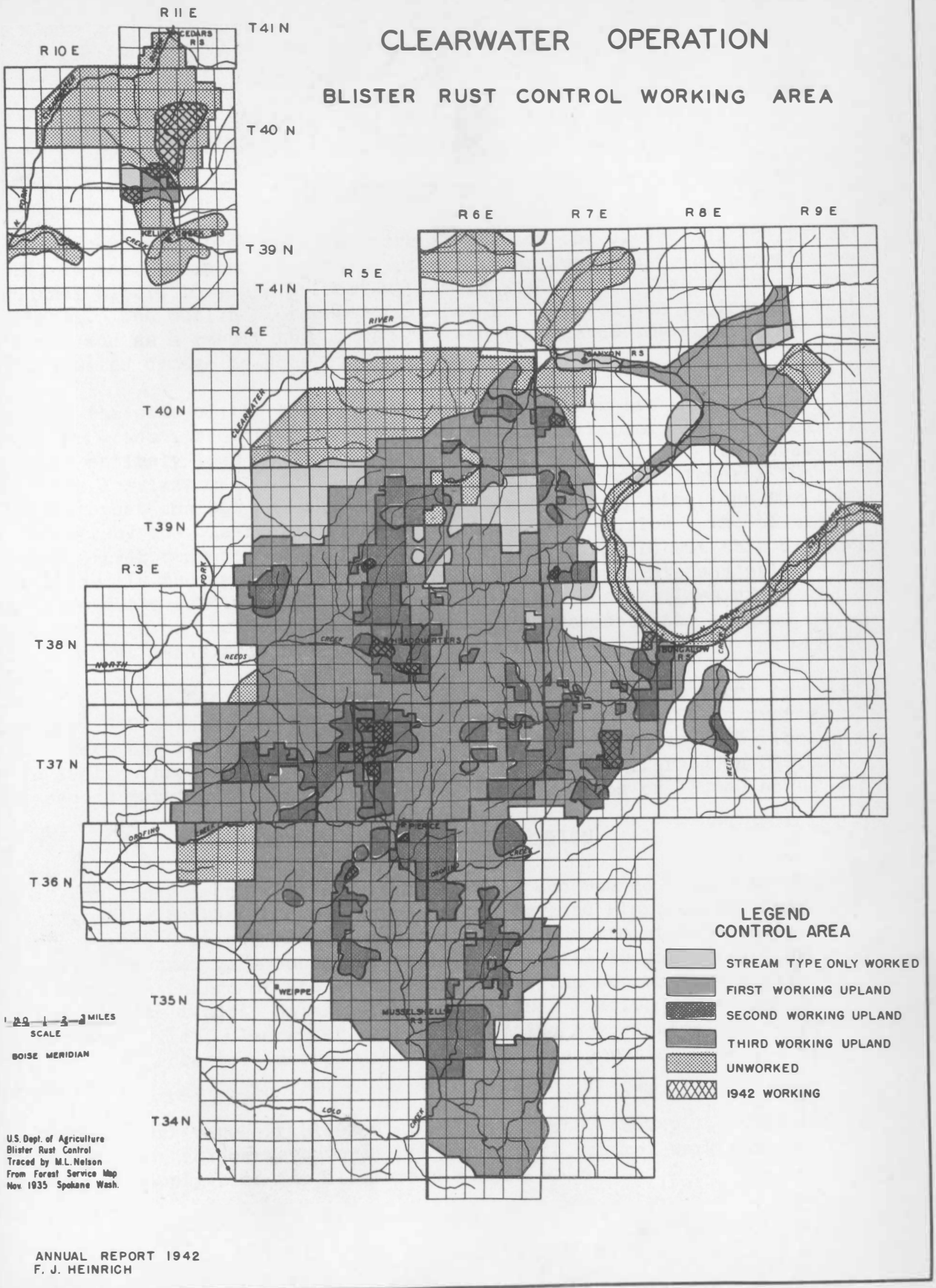
PROGRESS OF FIRST WORKING BY OWNERSHIP CLASSES, 1923-1942
INLAND EMPIRE

State	Ownership Class	Number of Acres			Acres on Which Working is Deferred	Total Acres White Pine
		Worked	Unworked	Total		
Idaho	National Forest	867,326	206,310	1,073,636	56,454	1,130,090
	Public Domain	16,482	14,068	30,550	1,040	31,590
	Subtotal Federal	883,808	220,378	1,104,186	57,494	1,161,680
	State	264,018	48,822	312,840	32,110	344,950
	Private	489,695	215,398	705,093	95,932	801,025
	Subtotal Other	753,713	264,220	1,017,933	128,042	1,145,975
	Total	1,637,521	484,598	2,122,119	185,536	2,307,655
Washington	National Forest	69,440	29,870	99,310		99,310
	Public Domain	315		315		315
	Subtotal Federal	69,755	29,870	99,625		99,625
	State	6,832	3,018	9,850		9,850
	Private	39,678	11,942	51,620		51,620
	Subtotal Other	46,510	14,960	61,470		61,470
	Total	116,265	44,830	161,095		161,095
Montana	National Forest	104,266	42,149	146,415	17,468	163,883
	Public Domain	40		40		40
	Subtotal Federal	104,306	42,149	146,455	17,468	163,923
	State	576	234	810		810
	Private	20,857	12,660	33,517	2,490	36,007
	Subtotal Other	21,433	12,894	34,327	2,490	36,817
	Total	125,739	55,043	180,782	19,958	200,740
Total	National Forest	1,041,032	278,329	1,319,361	73,922	1,393,283
	Public Domain	16,837	14,068	30,905	1,040	31,945
	Subtotal Federal	1,057,869	292,397	1,350,266	74,962	1,425,228
	State	271,426	52,074	323,500	32,110	355,610
	Private	550,230	240,000	790,230	98,422	888,652
	Subtotal Other	821,656	292,074	1,113,730	130,532	1,244,262
	Total	1,879,525	584,471	2,463,996	205,494	2,669,490

TABLE 11

TOTAL RIBES BY SPECIES ERADICATED, 1923-1942
INLAND EMPIRE

Working	Eradication Type	Acres	Ribes by Species								Total Ribes
			Ribes lacustre	Ribes viscosissimum	Ribes petiolare	Ribes inerme	Ribes irriguum	Ribes coloradense	Ribes triste	Ribes acerifolium	
First	Cutover (Prior 1940)	49,539	5,911,364	10,731,291	43,873	90,333	38,795				16,815,656
	Burn (Prior 1940)	8,181	789,491	2,077,346	568	17,486	9,292				2,894,193
	Reproduction	589,592	49,743,618	128,409,666	204,815	1,189,251	504,579	3,455	1,145		180,055,529
	Pole	356,064	14,201,294	12,939,362	65,233	385,968	233,465		462	3,914	27,829,698
	Mature	722,397	43,886,917	22,213,770	226,309	405,384	475,817	7,257	26	2,027	67,217,507
	Brush	25,041	1,522,994	3,196,630	19,257	97,116	20,835				4,856,832
	Subalpine	3,255	326,851	136,917		19					463,787
	Meadow-Field	2,569	5,010			7,121					12,131
	All Upland	1,756,638	116,387,539	179,703,982	560,055	2,192,678	1,282,783	10,712	1,633	5,941	300,145,823
	Stream	122,987	42,285,133	2,006,828	6,376,289	13,052,565	116,220	31,905	21,255	19,584	63,909,779
	All Types	1,879,525	158,672,672	181,710,810	6,936,344	15,245,243	1,399,003	42,617	22,888	25,525	364,055,102
Second	Cutover (1940-1942)	211	4,089	2,102							6,191
	Burn (1940-1942)	60	32,168	102,581							[illegible]
	Cutover (Prior 1940)	48,648	3,585,566	11,405,306	78,335	24,729	15,156				15,109,092
	Burn (Prior 1940)	1,613	430,471	512,718	5,447						948,636
	Reproduction	157,908	7,256,664	13,077,868	51,975	105,291	31,115		2,591		20,525,504
	Pole	76,376	2,227,068	2,065,775	25,808	39,928	1,740				4,360,319
	Mature	44,061	1,921,971	1,552,252	16,546	15,098	36,159		267		3,542,293
	Brush	2,354	69,103	158,464		875					228,442
	Subalpine	291	13,555	8,902							22,457
	Meadow-Field	10	72								72
	All Upland	331,532	15,540,727	28,885,968	178,111	185,921	84,170		2,858		44,877,755
	Stream	51,715	6,700,600	780,581	1,953,866	1,968,331	32,190		155,981		11,591,549
	All Types	383,247	22,241,327	29,666,549	2,131,977	2,154,252	116,360		158,839		56,469,304
Third	Cutover (1940-1942)	54	6,219	1,592							7,811
	Cutover (Prior 1940)	13,452	705,359	887,942	19,826	7,822	143				1,621,092
	Reproduction	22,870	901,723	1,261,423	8,386	10,559	214		114		2,182,419
	Pole	5,353	203,017	176,123	42	194	6				379,382
	Mature	2,258	149,443	52,661	8		1,728				203,840
	Brush	459	6,020	14,630		24					20,674
	Subalpine	88	2,510	2,838							5,348
	All Upland	44,534	1,974,291	2,397,209	28,262	18,599	2,091		114		4,420,566
	Stream	12,876	1,032,971	31,116	556,761	484,749			18,124		2,123,721
	All Types	57,410	3,007,262	2,428,325	585,023	503,348	2,091		18,238		6,544,287
All Workings	Cutover (1940-1942)	265	10,308	3,694							14,002
	Burn (1940-1942)	60	32,168	102,581							134,749
	Cutover (Prior 1940)	111,639	10,202,289	23,024,539	142,034	122,884	54,094				33,545,840
	Burn (Prior 1940)	9,794	1,219,962	2,590,064	6,015	17,486	9,292				3,842,819
	Reproduction	770,370	57,902,005	142,747,957	265,176	1,305,101	535,908	3,455	3,950		202,763,452
	Pole	437,793	16,631,379	15,181,260	91,083	426,090	235,211		462	3,914	32,569,399
	Mature	768,716	45,958,331	23,818,683	242,863	420,482	513,704	7,257	293	2,027	70,963,640
	Brush	27,854	1,598,117	3,369,724	19,257	98,015	20,835				5,105,948
	Subalpine	3,634	342,916	148,657		19					491,592
	Meadow-Field	2,579	5,082			7,121					12,203
	All Upland	2,132,704	133,902,557	210,987,159	766,428	2,397,198	1,369,044	10,712	4,605	5,941	349,443,644
	Stream	187,478	50,018,704	2,818,525	8,886,916	15,505,645	148,410	31,905	195,360	19,584	77,625,049
	All Types	2,320,182	183,921,261	213,805,684	9,653,344	17,902,843	1,517,454	42,617	199,965	25,525	427,068,693



ANNUAL REPORT 1942
F. J. HEINRICH

BLISTER RUST CONTROL WORK, CLEARWATER OPERATION, 1942

By
F. J. Heinrich, Associate Pathologist
David Kyle, Assistant Forester, U. S. Forest Service
H. J. Faulkner, Chief Scientific Aid

INTRODUCTION

When blister rust control measures were started on the Clearwater operation in 1929, it was estimated that white pine blister rust had to be brought under control within 10 years or serious damage would take place in the white pine stands. The outlined program could not be followed due to insufficient allotments and as a result the disease spread throughout the control area causing limited damage to some of the stands.

Since 1936 the size of the blister rust control program has steadily decreased through the gradual reduction in emergency relief work programs, WPA and CCC, which were entirely lost to blister rust control work in 1942. Fortunately, some of the loss was made up through the increase in regular federal funds for blister rust control and the renewal of financial contributions for the work in 1941 by the Clearwater Timber Protective Association. The planned program for 1942 represented an increase over that of 1941, but this did not materialize. In the case of the cooperative program on state and private lands there was a sufficient increase to counterbalance the loss of the WPA, but not the loss of the CCC. The labor shortage prevented the program on national forest lands from reaching its full quota.

As compared with 8,646 acres worked in 1941, there were 7,080 acres covered during the 1942 season, and yet the work in 1942 was done with an average of 1.43 man-days and 239 ribes per acre against 1.51 man-days and 123 ribes per acre in 1941. Through 1942, initial working has been performed on 395,006 acres, second working on 108,577 acres and third working on 13,640 acres.

ORGANIZATION AND ADMINISTRATION

Blister rust control activities were handled in accordance with a memorandum of understanding between the Bureau of Entomology and Plant Quarantine and the U. S. Forest Service, and between the Bureau and the state of Idaho. The Bureau personnel gave technical assistance to the Forest Service camps and had complete charge of the work performed by the cooperative camps on state and private lands. Splendid cooperation was received from the U. S. Forest Service, Clearwater Timber Protective Association, State of Idaho, Potlatch Forests, Incorporated, and other cooperating agencies and individuals.

Field headquarters were established at Pierce, Idaho, on May 1. This served as the operation headquarters for all blister rust control work and as a warehouse and supply base for all Bureau camps.

Blister rust control work on the Forest Service lands was discontinued as a special project handled by staff specialists and was turned over to the district rangers, and they were responsible for the work performed on their districts. The original plans called for an alternate ranger with several years of blister rust experience to handle the field work. Due to uncontrollable circumstances it was not possible to follow this plan throughout the season. Service and supply was moved to the Forest Service warehouse in order to coordinate truck transportation for all forest activities.

The blister rust control field organization was as follows:

Bureau of Entomology and Plant Quarantine	U. S. Forest Service
Fred J. Heinrich, Technical Supervisor	David Kyle, Forest Officer
Harry J. Faulkner, Assistant Operation Supervisor in charge of checking	

Program	Number Camps	Number Workers	Number Checkers
EQ-Cooperative	3	90	1
FS-Regular	5	236	1

Total number employed on blister rust control - 328

The first Forest Service camp was established on May 5, at the Upper Beaver Creek plantation. The last camp moved from the field on October 1. On May 25 the first Bureau camp was established near Pierce, Idaho, and continued until field work stopped September 10.

In general, the crewmen were the youngest that have been employed in regular camps. Many of the boys had never been engaged in any type of work before. This was their first job, which necessitated continuous training throughout the season. They had to be taught how to live in camp, how to care for themselves in the woods and how to perform the assigned duties in a safe and progressive manner. This created a problem that was further amplified by the fact that very few trained men were available as a nucleus around which to build the field crews. Out of a total of twelve trained supervisory personnel, only two were available throughout the 1942 field season. By continuous training and careful selection some very good crews were developed by the end of the field season. Most of the boys were of high school age, and many of them left the job to return to school about August 15.

The season was quite similar to 1941 in that rains were encountered almost continuously during the first two months. In June alone there were 16 days of recorded rainfall.

All blister rust crews were given intensive fire training and were figured in the general fire plan both with the Forest Service and the Clearwater Timber Protective Association. The fire situation on the Clearwater Forest during the past season was not serious; however, approximately three weeks were lost by the Forest Service crews when they were dispatched to the Idaho and Payette Forests during the last of August and the first part of September. The crews from the cooperative camps lost only a few days due to fire.

A two-day field conference was held for the Forest Service personnel at the close of the field season. The meeting was attended by the supervisory staff, rangers, and alternate rangers. All phases of the blister rust control activities were covered, with part of the time being spent in the field inspecting the work and discussing control problems.

LOCATION AND DESCRIPTION OF AREAS

The Bureau camps worked entirely on cutover areas in the vicinity of Pierce and Headquarters, Idaho. One camp was located near the Clearwater Timber Protective Association, and it worked areas in the Reeds and Deer Creek drainages. All of this was second and third working and consisted primarily of cleaning up areas which had previously supported a heavy population of ribes. The men in this camp were housed in a railroad car camp loaned by the Potlatch Forests, Incorporated.

Another camp was located on Quartz Creek at old PFI Camp 12. The area covered from this camp was in the Hollywood vicinity and the Three-Mile Creek drainage. Part of this area supported a light ribes concentration, and the ribes population was reduced to a maintenance standard wherever practicable.

A small crew was worked from the blister rust control headquarters. This crew did mostly spot working, cleaning up small isolated patches of ribes in both upland and stream types. The ribes population was quite low in most cases, averaging less than 50 per acre.

Camps operated by the Forest Service included three 33-man camps and two 66-man units. The majority of the work was concentrated in the Moose City area. The three camps in this vicinity were located on Moose, China and Osier Creek drainages. The camps on China and Osier Creeks worked almost entirely on chemical eradication of Ribes petiolare which occurred in heavy concentrations on the main creeks and tributaries. The camp at Moose Creek did some chemical ribes eradication but worked mainly in young pole and reproduction stands on Moose and Independent Creek drainages. Ribes eradication work is quite difficult in this district because of the large amount of R. petiolare in the streams and the heavy concentrations of exceptionally large R. lacustre in the upland stands. The work was not completed in any of the three camp areas.

A Forest Service camp was established at the Bungalow Ranger Station for a short period during the early field season. When the roads were passable, this camp moved to Three Bear and worked areas in the Tamarack Creek drainage consisting entirely of reproduction and pole stands.

A Forest Service crew worked on the Upper Beaver Creek plantation during the early part of the season. This area was burned and planted in 1940 and supported 2,000 ribes per acre. Working conditions were not extremely difficult due to the fact that the ribes were small and the area was worked during the early part of the season before other vegetation had leaved out. The greatest handicap was weather conditions during the time the work was performed. This camp later moved to Lodge Creek, and the work in that drainage was completed. The area was difficult to work due to the density of the

brush and the large number of old R. viscosissimum present. On July 15, this camp moved to the Sourdough Timber Sales area. The timber from this area was cut in 1939 and 1940 with only the mature white pine being removed. The present overwood is too heavy to permit development of white pine reproduction, consequently only part of the area which has been opened up sufficiently is being considered for blister rust control. Control work on the rest of the area will be postponed until such time as the residual stand is removed.

METHODS AND EQUIPMENT

Because of the inexperienced laborers employed during 1942 a standard 3-man crew was used primarily throughout the season. However, there was a variation in formation that was given limited use. In order to maintain the proper efficiency it became evident that some checking immediately behind the workers was necessary. The methods development project had demonstrated that grouping three or four crews on adjacent strips of greater than normal width with a man checking directly behind each 3-man crew and the foreman supervising and checking the entire gang formation increased the efficiency of the work while still covering the same amount of ground per man-day. This method worked out satisfactorily in several of the cutover areas. Some adjustment in the formation had to be made to meet various conditions, but the principle of checking directly behind the crews served to maintain high efficiency standards at no increase in cost. In practically all cases string was laid in advance as has been done in previous years. The stream type chemical work in the camps was carried on by the standard size chemical crews.

STATUS OF CONTROL

Although considerable progress has been made in ribes eradication work on the Clearwater operation since 1929, the blister rust situation still remains serious. Blister rust became established throughout the operation before control could be established. As a result heavy infection on certain areas has taken place, and some damage has resulted in stands within the control boundary.

In 1929 mature white pine comprised approximately 62 per cent of the control area. Since that time considerable logging has taken place creating a major control problem. The mature type required little or no blister rust control work since these stands are expected to be logged before damage takes place, but the protection of white pine reproduction following logging is an expensive job because of the germination of large numbers of ribes. The percentage of mature type in the control area has dropped to 45 per cent, meaning that 91,000 acres of cutover lands have been added to the control job. In approximately 50 per cent of the logged areas a heavy residual stand of secondary species is preventing the reestablishment of white pine, and for this reason they are not considered for control work. Some logged areas are also being placed in a deferred status because there is not an adequate seed source, and white pine regeneration is not taking place. To date most cutover areas of high priority have received at least one working and can be protected with some additional work.

The protection of white pine reproduction on cutover lands is going to be more difficult in the future unless particular care is given to the method of harvesting the present mature stands. Without an adequate seed source the period for regeneration from stored seed is relatively short. Germination of ribes and pine seed occurs at the same time, and because of their close association, infection naturally takes place before the ribes are large enough to be removed. If the stocking is more than adequate, as is the case on portions of sec. 17, T. 37 N., R. 5 E., in the Hollywood vicinity, it is possible to remove the ribes before too many young pine are killed to affect the stocking of the stand. A good seed source should always be left at the time of cutting if a future crop of pine is desired from natural seeding.

White pine reproduction stands 15 years old or older on the Clearwater operation are as a whole in fair condition. With few exceptions these stands can be permanently protected without much difficulty if an adequate control program is continued. On the Shoe Burn, Big Horn and Hemlock Creek areas no future control work is planned because of the high cost of working and the amount of disease already present.

The majority of white pine pole stands are in satisfactory condition with the exception of 2,500 acres of advanced pole in the Moose City district which has not been initially worked. Stands in French, Tamarack, Musselshell and Snake Creeks will need very little future work.

The Clearwater operation was originally a heavy R. petiolare belt. Nearly all the stream type at one time supported a heavy population of this ribes species. Chemical work has been carried on since 1929, and at the present time there remains only the Moose City district which has not been covered by chemical ribes eradication. This should be completed next year. On the Clearwater Timber Protective Association lands all streams within the control boundary have been thoroughly covered. Although a satisfactory job was done, two major streams, Washington and Schofield Creeks, and their tributaries must be mopped up during the 1943 field season. Ribes petiolare seedlings have become established along the banks and should be removed mainly by hand-pulling methods, although a small amount of chemical work will be needed.

PREERADICATION SURVEY

Areas were inspected throughout the season by the permanent personnel. This type of random inspection gives general information on the progress of the disease, regeneration and growth of ribes and pine, and other information necessary in evaluating white pine stands and planning control work. Where more detailed and specific information is required for planning the current and following seasons' work, a systematic survey is conducted by specially trained men.

CHECKING AND PINE DISEASE SURVEY

The activities of the checking organization were curtailed this season due to the difficulty of securing and holding experienced and qualified personnel. It was necessary to use the available, experienced and qualified men to fill the depleted ranks of eradication supervisors. However, a sufficient number of new men were trained to take care of the most essential checking work.

Complete four per cent checks were postponed on some areas where advance surveys and sample checks following eradication showed a very low ribes population. A check will be run in from three to five years in conjunction with the disease survey when some measure of the infection resulting from missed bushes can be obtained.

Advance surveys and post checks were run on areas worked during the past season where recent information on distribution and quantity of ribes was not available. After the close of the regular season advance survey was run on the remaining pole and reproduction stands in the Moose City basin area that had not been previously surveyed.

Regular check following eradication work was run on 3,017 acres of upland area, and 8,069 acres were covered on advance survey and post check.

Pine disease survey was limited to random inspection and sampling by permanent personnel and temporary overhead. Due to the extensive coverage of areas during the past several seasons, requirements for pine disease survey this year were small.

STATEMENT OF EXPENDITURES AND COSTS

The statement of expenditures and costs is shown in the following tables by the cooperative agency and the type of appropriation:

TABLE 1

EXPENDITURES BY APPROPRIATIONS, CALENDAR YEAR 1942
CLEARWATER OPERATION

Cooperating Agency	Appropriation	Amount
Bureau of Entomology and Plant Quarantine	Regular BLR-1-4	$ 7,086.85
	Regular BLR-3-4	12,727.51
	Subtotal	19,814.36
State of Idaho Clearwater Timber Protective Association	State BLR-3-4	9,865.87
	Private BLR-3-4	6,000.00
	Subtotal	15,865.87
Forest Service	Regular BLR-4	80,728.80
Total		$116,409.03

TABLE 2

CLASSIFIED EXPENDITURES, CALENDAR YEAR 1942
CLEARWATER OPERATION

Item	Bureau of Entomology and Plant Quarantine				Forest Service	
	Regular BLR-1-4	Regular BLR-3-4	State and Private BLR-3-4	Total	Regular BLR-4	Total
Sal. perm. men	$5,739.62			$ 5,739.62	$ 1,982.50	$ 7,722.12
Sal. temp. men		$ 1,812.87	$ 1,630.33	3,443.20	12,341.79	15,784.99
Wages, temp. labs.	493.36	5,913.72	14,235.54	20,642.62	46,166.92	66,809.54
Subs. supplies		4,510.88		4,510.88	15,261.97	19,772.85
Equipment	9.51	1.57		11.08	3,615.49	3,626.57
Travel & transp.	250.26	357.71		607.97	1,155.35	1,763.32
Other supplies	594.10	130.76		724.86	204.78	929.64
Total	$7,086.85	$12,727.51	$15,865.87	$35,680.23	$80,728.80	$116,409.03

TABLE 2A

DISTRIBUTION OF EXPENDITURES BY PROJECTS, 1942
CLEARWATER OPERATION

Project	Expenditures	Number Effective Man-Days	Effective Man-Day Cost
Planning, Coordination and Technical Direction			
BEPQ Regular BLR-1-4	$ 7,086.85		
Cooperative - State and Private Lands			
BEPQ Regular BLR-3-4	12,727.51		
State of Idaho BLR-3-4	9,865.87	3,531	$ 8.10
CTPA BLR-3-4	6,000.00		
Total	28,593.38		
National Forest Lands			
Forest Service Regular BLR-4	$80,728.80	6,612	$12.21

	Bureau	Forest Service
Number meals served	20,793	43,920
Average cost per meal	$0.217	$0.347
Pounds of twine	847	1,710
Pounds of chemical		28,171

SUMMARY OF RIBES ERADICATION, 1942
CLEARWATER OPERATION

TABLE 3 - SUMMARY OF ALL WORKINGS

Eradication Type	Acres First Working	Acres Second Working	Acres Third Working	Total Acres	Effective Man-Days	Total Ribes	Gallons Spray	Ribes Remaining Per Acre	
								Bushes	Live Stem
Burn (1940-1942)		60		60	232	134,749			
Cutover (Prior 1940)		708	2,933	3,641	3,903	863,268		8.9	13.0
Reproduction	1,328	218		1,546	2,704	244,542		25.0	77.5
Pole		1,142		1,142	1,095	75,818			
All Upland	1,328	2,128	2,933	6,389	7,934	1,318,377		11.1	21.7
Stream (Hand)	378	106	207	691	1,410	310,665			
Stream (Chemical)	378	106		484	799	65,715	21,905		
All Stream	378	106	207	691	2,209	376,380			
All Types	1,706	2,234	3,140	7,080	10,143	1,694,757		11.1	21.7

TABLE 3A - FIRST WORKING

Eradication Type	Acres	Effective Man-Days	Total Ribes	Gallons Spray	Per Acre Basis			Ribes Remaining Per Acre	
					Man-Days	Ribes	Gallons Spray	Bushes	Live Stem
Reproduction	1,328	2,061	194,892		1.55	147		29.2	104.2
Stream (Hand)	378	1,151	294,131		3.04	778			
Stream (Chemical)	378	691	63,837	21,279	1.83	169	56		
All Stream	378	1,842	357,968		4.87	947			
All Types	1,706	3,903	552,860		2.29	324		29.2	104.2
TABLE 3B - SECOND WORKING									
Burn (1940-1942)	60	232	134,749		3.87	2,246			
Cutover (Prior 1940)	708	821	737,913		1.16	1,042		13.3	28.3
Reproduction	218	643	49,650		2.95	228		18.6	36.7
Pole	1,142	1,095	75,818		.96	66			
All Upland	2,128	2,791	998,130		1.31	469		17.4	34.8
Stream (Hand)	106	112	5,600		1.06	53			
Stream (Chemical)	106	108	1,878	626	1.02	18	6		
All Stream	106	220	7,478		2.08	71			
All Types	2,234	3,011	1,005,608		1.35	450		17.4	34.8
TABLE 3C - THIRD WORKING									
Cutover (Prior 1940)	2,933	3,082	125,355		1.05	43		8.8	12.7
Stream (Hand)	207	147	10,934		.71	53			
All Types	3,140	3,229	136,289		1.03	43		8.8	12.7

TABLE 4

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1942
CLEARWATER OPERATION

Working	Class	Acres	Effective Man-Days	Total Ribes	Gallons Spray	Per Acre Basis			Ribes Remaining Per Acre	
						Man-Days	Ribes	Gallons Per Sprayed Area	Bushes	Live Stem
First	FS-Reg.	1,706	3,903	552,860	21,279	2.29	324	56	29.2	104.2
Second	EQ-Coop.	436	302	50,202		.69	115		13.3	28.3
	FS-Reg.	1,798	2,709	955,406	626	1.51	531		18.6	36.7
	Total	2,234	3,011	1,005,608	626	1.35	450		17.4	34.8
Third	EQ-Coop.	3,140	3,229	136,289		1.03	43		8.8	12.7
All Workings	EQ-Coop.	3,576	3,531	186,491		.99	52		8.9	13.0
	FS-Reg.	3,504	6,612	1,508,266	21,905	1.89	430	45	25.0	77.5
	Total	7,080	10,143	1,694,757	21,905	1.43	239	45	11.1	21.7

TABLE 5

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1942
CLEARWATER OPERATION

State	Working	Number of Acres Worked											
		By Forest Service			By Bureau of Entomology and Plant Quarantine				Total				
									Federal	Other			
		National Forest	Private	Total	National Forest	State	Private	Total	National Forest	State	Private	Total	Total
Idaho	First	1,616	90	1,706					1,616		90	90	1,706
	Second	1,638	160	1,798			436	436	1,638		596	596	2,234
	Third				120	294	2,726	3,140	120	294	2,726	3,020	3,140
	Total	3,254	250	3,504	120	294	3,162	3,576	3,374	294	3,412	3,706	7,080

TABLE 6

TOTAL RIBES BY SPECIES ERADICATED, 1942
CLEARWATER OPERATION

Working	Eradication Type	Acres	Ribes by Species				Total Ribes
			Ribes lacustre	Ribes viscosissimum	Ribes petiolare	Ribes irriguum	
First	Reproduction	1,328	150,313	44,565	14		194,892
	Stream	378	294,131		63,837		357,968
	All Types	1,706	444,444	44,565	63,851		552,860
Second	Burn (1940-1942)	60	32,168	102,581			134,749
	Cutover (Prior 1940)	708	42,851	690,535	148	4,379	737,913
	Reproduction	218	26,954	22,696			49,650
	Pole	1,142	48,337	27,415	66		75,818
	All Upland	2,128	150,310	843,227	214	4,379	998,130
	Stream	106	5,600		1,878		7,478
	All Types	2,234	155,910	843,227	2,092	4,379	1,005,608
Third	Cutover (Prior 1940)	2,933	40,302	79,746	5,307		125,355
	Stream	207	6,392	17	4,525		10,934
	All Types	3,140	46,694	79,763	9,832		136,289
All Workings	Burn (1940-1942)	60	32,168	102,581			134,749
	Cutover (Prior 1940)	3,641	83,153	770,281	5,455	4,379	863,268
	Reproduction	1,546	177,267	67,261	14		244,542
	Pole	1,142	48,337	27,415	66		75,818
	All Upland	6,389	340,925	967,538	5,535	4,379	1,318,377
	Stream	691	306,123	17	70,240		376,380
	All Types	7,080	647,048	967,555	75,775	4,379	1,694,757

SUMMARY OF RIBES ERADICATION, 1929-1942
CLEARWATER OPERATION

TABLE 7 - SUMMARY OF ALL WORKINGS

Eradication Type	Acres First Working	Acres Second Working	Acres Third Working	Total Acres	Effective Man-Days	Total Ribes	Gallons Spray
Burn (1940-1942)		60		60	232	134,749	
Cutover (Prior 1940)	27,726	33,053	8,935	69,714	70,188	22,049,184	
Burn (Prior 1940)	1,045	432		1,477	1,777	1,285,330	
Reproduction	70,879	21,171	2,324	94,374	139,737	36,761,160	
Pole	29,211	13,995		43,206	24,030	4,896,421	
Mature	219,289	16,067		235,356	107,681	24,234,186	
Brush	2,795	79		2,874	2,578	732,633	
Subalpine	122			122	118	53,948	
Meadow-Field	1,890			1,890			
All Upland	352,957	84,857	11,259	449,073	346,341	90,147,611	
Stream (Hand)	41,984	22,041	2,381	66,406	64,314	14,330,099	
Stream (Chemical)	14,808	5,815	498	21,121	39,196	2,736,420	911,940
Stream (Mechanical)	65	13		78	1,258	188,983	
Stream (Zone)		1,666		1,666	1,129	280,094	
All Stream	42,049	23,720	2,381	68,150	105,897	17,535,596	
All Types	395,006	108,577	13,640	517,223	452,238	107,683,207	

TABLE 7A - FIRST WORKING

Eradication Type	Acres	Effective Man-Days	Total Ribes	Gallons Spray	Per Acre Basis Man-Days	Per Acre Basis Ribes	Per Acre Basis Gallons Spray
Cutover (Prior 1940)	27,726	25,888	10,610,089		.93	383	
Burn (Prior 1940)	1,045	1,246	917,609		1.19	878	
Reproduction	70,879	106,529	33,322,668		1.50	470	
Pole	29,211	16,138	3,785,629		.55	130	
Mature	219,289	99,880	23,422,354		.46	107	
Brush	2,795	2,536	729,247		.91	261	
Subalpine	122	118	53,948		.97	442	
Meadow-Field	1,890						
All Upland	352,957	252,335	72,841,544		.71	206	
Stream (Hand)	41,984	44,992	11,399,947		1.07	272	
Stream (Chemical)	14,808	30,746	2,364,692	787,964	2.08	160	53
Stream (Mechanical)	65	1,233	188,983		18.97	2,907	
All Stream	42,049	76,971	13,953,622		1.83	332	
All Types	395,006	329,306	86,795,166		.83	220	

TABLE 7B - SECOND WORKING

Burn (1940-1942)	60	232	134,749		3.87	2,246	
Cutover (Prior 1940)	33,053	34,368	10,510,047		1.04	318	
Burn (Prior 1940)	432	531	367,721		1.23	851	
Reproduction	21,171	30,210	3,191,469		1.43	151	
Pole	13,995	7,892	1,110,792		.56	79	
Mature	16,067	7,801	811,832		.49	51	
Brush	79	42	3,386		.53	43	
All Upland	84,857	81,076	16,129,996		.96	190	
Stream (Hand)	22,041	17,571	2,683,855		.80	122	
Stream (Chemical)	5,815	8,096	357,055	119,085	1.39	61	20
Stream (Mechanical)	13	25			1.92		
Stream (Zone)	1,666	1,129	280,094		.68	168	
All Stream	23,720	26,821	3,321,004		1.13	140	
All Types	108,577	107,897	19,451,000		.99	179	

TABLE 7C - THIRD WORKING

Cutover (Prior 1940)	8,935	9,932	929,048		1.11	104	
Reproduction	2,324	2,998	247,023		1.29	106	
All Upland	11,259	12,930	1,176,071		1.15	104	
Stream (Hand)	2,381	1,751	246,297		.74	103	
Stream (Chemical)	498	354	14,673	4,891	.71	29	10
All Stream	2,381	2,105	260,970		.88	110	
All Types	13,640	15,035	1,437,041		1.10	105	

TABLE 8

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1929-1942
CLEARWATER OPERATION

Working	Class	Acres	Effective Man-Days	Total Ribes	Gallons Spray	Per Acre Basis		
						Man-Days	Ribes	Gallons Per Sprayed Area
First	EQ-Reg.	4,412	5,273	1,129,228	79,864	1.20	256	41
	EQ-Coop.	24,005	16,862	3,769,434	118,973	.70	157	34
	EQ-Emerg.	81,649	73,206	20,560,823	88,983	.90	252	75
	FS-Reg.	76,045	58,498	20,249,412	123,660	.77	266	38
	FS-Emerg.	43,963	36,790	14,033,179	11,694	.84	319	79
	CCC	164,932	138,677	27,053,090	364,790	.84	164	73
	Total	395,006	329,306	86,795,166	787,964	.83	220	52
Second	EQ-Coop.	4,863	3,097	379,652	8,404	.64	78	5
	EQ-Emerg.	46,995	45,667	9,160,811	45,754	.97	195	29
	FS-Reg.	24,933	26,169	4,274,520	11,580	1.05	171	5
	FS-Emerg.	10,747	7,526	689,942	10,051	.70	64	22
	CCC	21,039	25,438	4,946,075	43,296	1.21	235	27
	Total	108,577	107,897	19,451,000	119,085	.99	179	15
Third	EQ-Coop.	4,313	4,521	244,065		1.05	57	
	EQ-Emerg.	5,326	6,404	676,459	2,110	1.20	127	19
	FS-Reg.	1,292	1,291	102,138		1.00	79	
	FS-Emerg.	1,198	1,066	171,901	2,270	.89	143	13
	CCC	1,511	1,753	242,478	511	1.16	160	2
	Total	13,640	15,035	1,437,041	4,891	1.10	105	9
All Workings	EQ-Reg.	4,412	5,273	1,129,228	79,864	1.20	256	41
	EQ-Coop.	33,181	24,480	4,393,151	127,377	.74	132	25
	EQ-Emerg.	133,970	125,277	30,398,093	136,847	.94	227	47
	FS-Reg.	102,270	85,958	24,626,070	135,240	.84	241	25
	FS-Emerg.	55,908	45,382	14,895,022	24,015	.81	266	31
	CCC	187,482	165,868	32,241,643	408,597	.88	172	60
	Total	517,223	452,238	107,683,207	911,940	.87	208	40

TABLE 9

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1929-1942
CLEARWATER OPERATION

Working	Number of Acres Worked						
	Federal			Other			Total
	National Forest	Public Domain	Total	State	Private	Total	
First	149,802	3,680	153,482	78,834	162,690	241,524	395,006
Second	49,083	628	49,711	14,808	44,058	58,866	108,577
Third	3,780	12	3,792	1,177	8,671	9,848	13,640
Total	202,665	4,320	206,985	94,819	215,419	310,238	517,223

TABLE 10

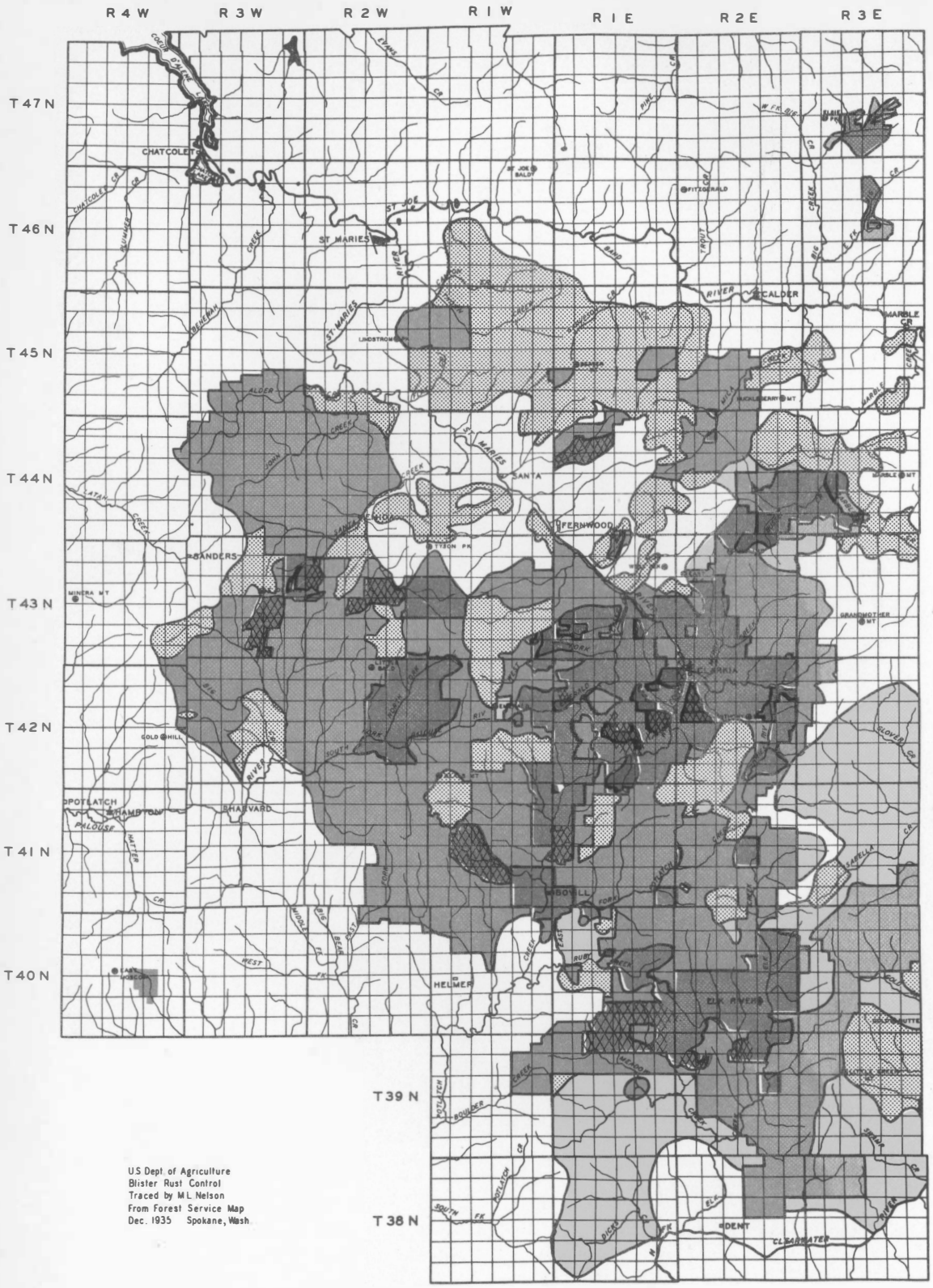
PROGRESS OF FIRST WORKING BY OWNERSHIP CLASSES, 1929-1942
CLEARWATER OPERATION

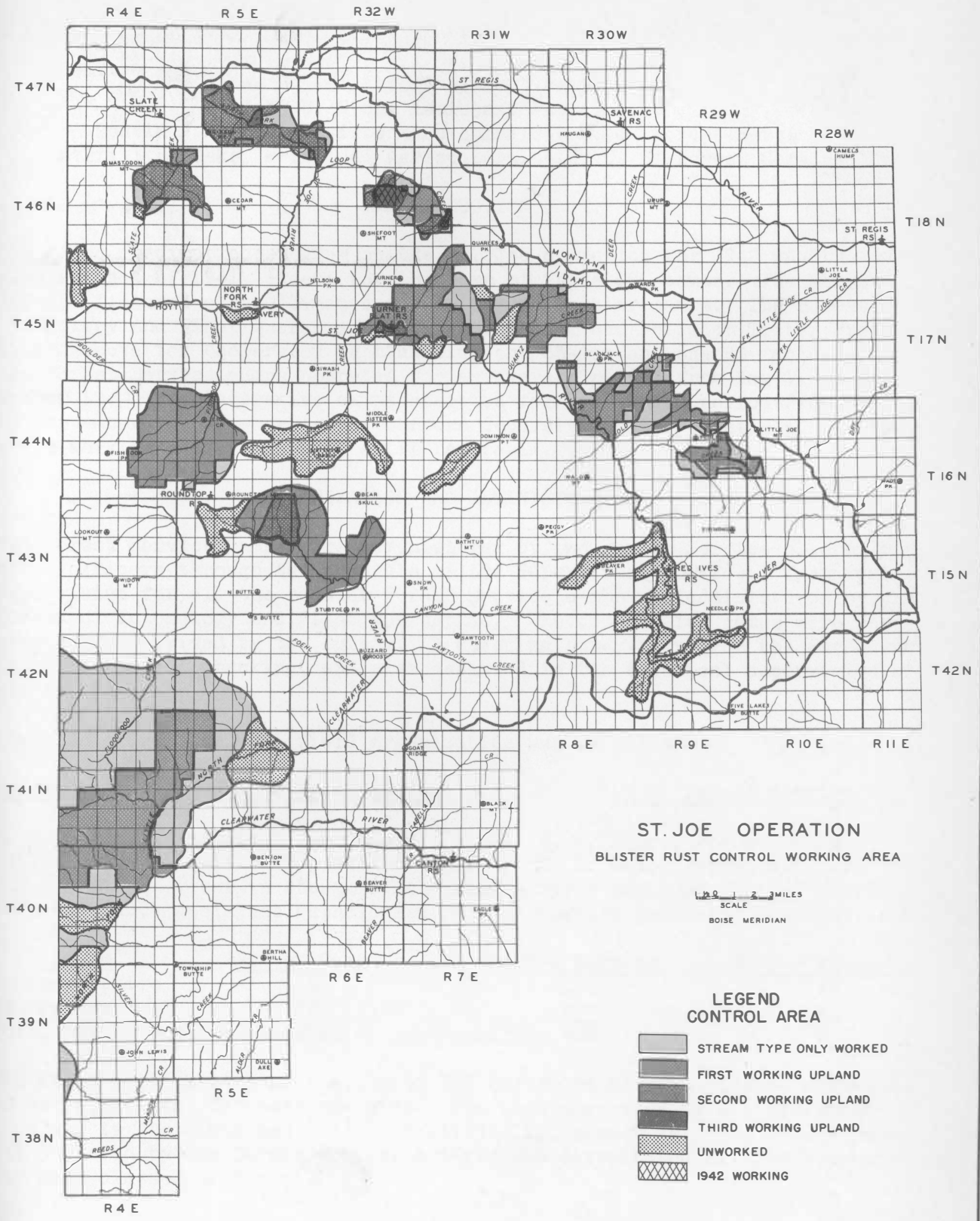
Ownership Class	Number of Acres			Acres on Which Working Is Deferred	Total Acres White Pine
	Worked	Unworked	Total		
National Forest	149,802	46,068	195,870	8,860	204,730
Public Domain	3,680	350	4,030		4,030
Subtotal Federal	153,482	46,418	199,900	8,860	208,760
State	78,834	2,956	81,790	11,200	92,990
Private	162,690	17,620	180,310	27,940	208,250
Subtotal Other	241,524	20,576	262,100	39,140	301,240
Total	395,006	66,994	462,000	48,000	510,000

TABLE 11

TOTAL RIBES BY SPECIES ERADICATED, 1929-1942
CLEARWATER OPERATION

Working	Eradication Type	Acres	Ribes by Species						Total Ribes
			Ribes lacustre	Ribes viscosissimum	Ribes petiolare	Ribes inerme	Ribes irriguum	Ribes triste	
First	Cutover (Prior 1940)	27,726	2,100,601	8,431,923	38,603	27,752	11,210		10,610,089
	Burn (Prior 1940)	1,045	74,796	838,377	568		3,868		917,609
	Reproduction	70,879	7,893,438	25,174,796	75,977	47,326	131,131		33,322,668
	Pole	29,211	2,467,634	1,278,820	31,617	6	7,090	462	3,785,629
	Mature	219,289	16,261,450	6,795,503	197,832	107,922	59,621	26	23,422,354
	Brush	2,795	210,516	490,931	17,270	114	10,416		729,247
	Subalpine	122	53,500	448					53,948
	Meadow-Field	1,890							
	All Upland	352,957	29,061,935	43,010,798	361,867	183,120	223,336	488	72,841,544
	Stream	42,049	10,155,156	324,255	2,746,983	701,834	25,394		13,953,622
	All Types	395,006	39,217,091	43,335,053	3,108,850	884,954	248,730	488	86,795,166
Second	Burn (1940-1942)	60	32,168	102,581					134,749
	Cutover (Prior 1940)	33,053	1,174,310	9,245,331	77,606	724	12,076		10,510,047
	Burn (Prior 1940)	432	19,437	342,837	5,447				367,721
	Reproduction	21,171	720,132	2,459,286	12,011	4	36		3,191,469
	Pole	13,995	545,661	548,785	16,095	1	250		1,110,792
	Mature	16,067	395,208	400,473	15,768	116		267	811,832
	Brush	79	424	2,962					3,386
	All Upland	84,857	2,887,340	13,102,255	126,927	845	12,362	267	16,129,996
	Stream	23,720	1,888,177	516,470	823,824	76,716	9,141	6,676	3,321,004
	All Types	108,577	4,775,517	13,618,725	950,751	77,561	21,503	6,943	19,451,000
Third	Cutover (Prior 1940)	8,935	164,064	745,015	19,826		143		929,048
	Reproduction	2,324	126,520	118,555	1,934		14		247,023
	All Upland	11,259	290,584	863,570	21,760		157		1,176,071
	Stream	2,381	184,606	2,055	51,493	22,816			260,970
	All Types	13,640	475,190	865,625	73,253	22,816	157		1,437,041
All Workings	Burn (1940-1942)	60	32,168	102,581					134,749
	Cutover (Prior 1940)	69,714	3,438,975	18,422,269	136,035	28,476	23,429		22,049,184
	Burn (Prior 1940)	1,477	94,233	1,181,214	6,015		3,868		1,285,330
	Reproduction	94,374	8,740,090	27,752,637	89,922	47,330	131,181		36,761,160
	Pole	43,206	3,013,295	1,827,605	47,712	7	7,340	462	4,896,421
	Mature	235,356	16,656,658	7,195,976	213,600	108,038	59,621	293	24,234,186
	Brush	2,874	210,940	493,893	17,270	114	10,416		732,633
	Subalpine	122	53,500	448					53,948
	Meadow-Field	1,890							
	All Upland	449,073	32,239,859	56,976,623	510,554	183,965	235,855	755	90,147,611
	Stream	68,150	12,227,939	842,780	3,622,300	801,366	34,535	6,676	17,535,596
	All Types	517,223	44,467,798	57,819,403	4,132,854	985,331	270,390	7,431	107,683,207


R4W
R3W
R2W
R1W
R1E
R2E
R3E
T47N
T46N
T45N
T44N
T43N
T42N
T41N
T40N
T39N
T38N
CHATCOLET
ST MARIES
CALDER
FERNWOOD
SANDERS
SANTA
SHAWARD
HELMER
DENT
CLEARWATER
U.S Dept. of Agriculture
Blister Rust Control
Traced by M.L. Nelson
From Forest Service Map
Dec. 1935 Spokane, Wash.


R 4 E
R 5 E
R 32 W
R 31 W
R 30 W
R 29 W
R 28 W
T 47 N
T 46 N
T 45 N
T 44 N
T 43 N
T 42 N
T 41 N
T 40 N
T 39 N
T 38 N
T 18 N
T 17 N
T 16 N
T 15 N
T 42 N
R 8 E
R 9 E
R 10 E
R 11 E
R 6 E
R 7 E
R 5 E
R 4 E
ST REGIS
SLATE CREEK
SAVENAC RS
HAUGAN
CAMELS HUMP
MASTODON MT
CEDAR MT
SHEFOOT MT
QUARTZ PK
UNUP MT
ST REGIS RS
LITTLE JOE
MONTANA
IDAHO
NELSON PK
TURNER PK
WARDS PK
NORTH FORK RS
HOYT
AVERY
TURNER FLAT RS
ST JOE
SIWASH PK
BLANCHACK PK
LITTLE JOE MT
MIDDLE SISTER PK
DOMINION MT
FISH HOOK PK
ROUNDTOP RS
BEAR SKULL
WALDO MT
MAUD PK
LOOKOUT MT
BATHTUB MT
PEGGY PK
BEAVER PK
RED IVES RS
WIDOW MT
N BUTTE
S BUTTE
STUBTOE PK
SNOW PK
NEEDLE PK
SAWTOOTH PK
BUZZARD ROOST
FIVE LAKES BUTTE
GOAT RIDGE
BLACK MT
CLEARWATER
BENJON BUTTE
BEAVER BUTTE
CANTON RS
EAGLE PK
BERTHA HILL
TOWNSHIP BUTTE
JOHN LEWIS
BULL ARE
REEDS
ST. JOE OPERATION
BLISTER RUST CONTROL WORKING AREA
SCALE
MILES
BOISE MERIDIAN
LEGEND
CONTROL AREA
STREAM TYPE ONLY WORKED
FIRST WORKING UPLAND
SECOND WORKING UPLAND
THIRD WORKING UPLAND
UNWORKED
1942 WORKING

BLISTER RUST CONTROL WORK, ST. JOE OPERATION, 1942

By
W. F. Painter, Assistant Pathologist
John C. Gynn, Assistant Pathologist
Donald J. Moore, Assistant Pathologist, U. S. Forest Service
Merrill D. Oaks, Principal Agricultural Aid, U. S. Forest Service

INTRODUCTION

The ribes eradication program on the St. Joe operation for 1942 was the same size as that of 1941, except for the loss of three CCC camps. The Forest Service financed eight 33-man and five 66-man regular camps. The Bureau of Entomology and Plant Quarantine, State of Idaho, and Potlatch Timber Protective Association cooperated in financing one 33-man and one 66-man camp. The Forest Service camps operated for an average period from May 11 to September 13. The cooperative camps operated for an average period from May 21 to September 15. A shortage of workers necessitated the closing of all camps while working conditions were still favorable.

ORGANIZATION AND ADMINISTRATION

The Forest Service camps were administered by two Forest Service blister rust staff officers through the channels of the Supervisor's office. Technical supervision for all the regular Forest Service camps was administered by the Bureau of Entomology and Plant Quarantine. The cooperative camps were operated and supervised by the Bureau. A checking supervisor from the Bureau was in charge of all checking, and also assisted in the technical supervision of all the camps.

The blister rust control field organization was as follows:

Bureau of Entomology and Plant Quarantine	U. S. Forest Service
H. J. Hartman, Technical Supervisor	D. J. Moore, Forest Officer
W. F. Painter, Assistant Operation Supervisor in charge of checking	M. D. Oaks, Forest Officer
	Byron Amsbaugh, Unit Supervisor
John C. Gynn, Assistant Pathologist	Charles Schwartz, Unit Supervisor

Program	Number Camps	Number Workers	Number Checkers
EQ-Cooperative	2	100	1
FS-Regular	13	550	8
Total number employed on blister rust control		650	9

The field headquarters maintained by the Bureau at Clarkia, Idaho, served as an operating base for both agencies. The transportation of all equipment and supplies to the camps was handled individually by each agency. A warehouseman employed by the Forest Service ordered and distributed all the supplies for both classes of camps.

Former blister rust workers whose services were satisfactory during the 1941 season were contacted prior to the field season as to their availability and their desire to accept employment on blister rust. Approximately 30 per cent of the men who were contacted reported for work when called. The remaining 70 per cent of the workers were inexperienced men who were recruited through the local high schools and from various colleges and universities throughout the country. Almost continuous rains in May and June interrupted the field work. As a result many of the experienced men as well as the more capable inexperienced men left to seek better paying jobs. The replacements were usually younger men, many being 15, 16, and 17 years old. When favorable weather conditions made field work possible most of the camps were filled with inexperienced and very young workers. In several cases it was necessary to employ inexperienced men as camp foremen. The labor turnover was such that a constant training program was necessary throughout the summer in all of the camps.

LOCATION AND DESCRIPTION OF AREAS

Ribes eradication in 1942 was confined to well established pole and reproduction stands. Except for 50 acres of plantation which were given first working, all effort was confined to second and third working. Areas worked were included in the St. Maries, Palouse, and Elk River drainages.

The heavy demand for lumber for war needs greatly accelerated logging on this operation during the 1942 season. White fir, Douglas fir, cedar and hemlock, usually not cut during white pine logging operations, are now being harvested along with the white pine. However, in practically all of the logged areas the number of inferior trees remaining precludes the establishment of satisfactory white pine reproduction. There is no immediate need for control work on any of the recently logged areas.

METHODS AND EQUIPMENT

The standard eradication practices as outlined in the manual with modifications to meet existing field conditions were employed throughout the operation. The number of inexperienced men made the laying of string line in advance of the eradication crews a universal practice. This method tended to improve the quality as well as the quantity of the work. The use of three 2-man crews with a straw boss working and checking behind the crews proved very satisfactory especially with inexperienced labor.

PREERADICATION SURVEY

A five-man survey crew financed by regular Forest Service funds inspected a number of white pine areas subsequent to the eradication season. Parallel strips were run every 10 chains and 4-milacre plots were taken at the end of each chain to determine the presence of white pine in relation to other species. Approximately 18,560 acres were inspected at an average cost of $0.05 per acre. The information will be valuable in planning future eradication programs and will aid in eliminating marginal pine areas.

CHECKING

There were three checkers available for the 1942 field season who worked during 1941. Nine experienced eradication men were trained for checking work. Additional checkers would have been trained but qualified workers were not available. Constant training and supervision were necessary throughout the season in order to insure a high quality check on worked areas. Seventy per cent of the checkers' time was devoted to regular check, 20 per cent to post check and 10 per cent assisting in ribes eradication work.

A total of 22,176 acres of first, second and third working was checked for an average cost of $0.127 per acre.

For the most part all areas currently post checked were worked during the 1942 field season. Regular checking activities prevented any extensive post checking, and the loss of all checking personnel by mid-September precluded any disease survey on the operation.

CONTROL STATUS

The over-all blister rust control picture on the St. Joe operation may be summarized as follows:

Through the 1942 field season 535,917 acres have been given first working, 138,609 acres have been worked twice, and 18,156 acres three times. Approximately 60 per cent of the total area within the control unit has been worked once, 16 per cent twice, and 2 per cent for the third time. Of the remaining 40 per cent of unworked area at least 30 per cent may be deferred indefinitely in that it represents mature timber which is being logged or will be logged in the near future. There are 255,236 acres requiring rework. This is 42 per cent of the total area represented by first working. There are 101,804 acres classified for post check. Past inspections of post check areas indicate that 60 per cent of the areas inspected would require additional work and 40 per cent would be classified as maintenance. There are 208,877 acres of maintenance which is 39 per cent of the total area worked.

The over-all infection condition on the operation is very encouraging. There have been noticeable increases in certain areas which were originally heavy infection centers. Generally the increases for other areas have been very minor. If the present size program can be maintained with a possible increase in the number of camps, very effective control will be accomplished during the coming years.

STATEMENT OF EXPENDITURES AND COSTS

The statement of expenditures and costs is shown in the following tables by the cooperative agency and the type of appropriation:

TABLE 1

EXPENDITURES BY APPROPRIATIONS, CALENDAR YEAR 1942
ST. JOE OPERATION

Cooperating Agency	Appropriation	Amount
Bureau of Entomology and Plant Quarantine	Regular BLR-1-4	$ 12,331.39
	Regular BLR-3-4	16,689.55
	Subtotal	29,020.94
State of Idaho Potlatch Timber Protective Association	State BLR-3-4	3,809.95
	Private BLR-3-4	5,200.34
	Subtotal	9,010.29
Forest Service	Regular BLR-4	179,835.55
Total		$217,866.78

TABLE 2

CLASSIFIED EXPENDITURES, CALENDAR YEAR 1942
ST. JOE OPERATION

Item	Bureau of Entomology and Plant Quarantine				Forest Service	
	Regular BLR-1-4	Regular BLR-3-4	State and Private BLR-3-4	Total	Regular BLR-4	Total
Sal. perm. men	$ 8,560.95			$ 8,560.95	$ 6,268.33	$ 14,829.28
Sal. temp. men	191.07	$ 1,808.86	$ 420.71	2,420.64		2,420.64
Wages, temp. labs.	1,352.53	12,066.45	8,589.58	22,008.56	129,388.03	151,396.59
Subs. supplies	299.76	2,290.74		2,590.50	33,442.98	36,033.48
Equipment	16.00	1.61		17.61	6,906.77	6,924.38
Travel & transp.	389.96	344.66		734.62	1,351.25	2,085.87
Chemicals					362.60	362.60
Twine					871.40	871.40
Other supplies	1,521.12	177.23		1,698.35	1,244.19	2,942.54
Total	$12,331.39	$16,689.55	$9,010.29	$38,031.23	$179,835.55	$217,866.78

TABLE 2A

DISTRIBUTION OF EXPENDITURES BY PROJECTS, 1942
ST. JOE OPERATION

Project	Expenditures	Number Effective Man-Days	Effective Man-Day Cost
Planning, Coordination and Technical Direction			
BEPQ Regular BLR-1-4	$ 12,331.39		
Cooperative - State and Private Lands			
BEPQ Regular BLR-3-4	16,689.55		
State of Idaho BLR-3-4	3,809.95	3,537	$ 7.27
PTPA BLR-3-4	5,200.34		
Total	25,699.84		
National Forest Lands			
Forest Service Regular BLR-4	$179,835.55	17,431	$10.32

	Bureau	Forest Service
Number meals served	21,250	93,875
Average cost per meal	$0.228	$0.289
Pounds of twine	862	2,530
Pounds of chemical		3,300

SUMMARY OF RIBES ERADICATION, 1942
ST. JOE OPERATION

TABLE 3 - SUMMARY OF ALL WORKINGS

Eradication Type	Acres First Working	Acres Second Working	Acres Third Working	Total Acres	Effective Man-Days	Total Ribes	Gallons Spray	Ribes Remaining Per Acre	
								Bushes	Live Stem
Cutover (1940-1942)		211	54	265	189	14,002		7	6
Cutover (Prior 1940)		2,338		2,338	2,641	172,662		6	22
Burn (Prior 1940)		20		20	42	377		6	37
Reproduction	50	6,729	3,364	10,143	11,738	284,472		4	12
Pole		7,765	1,087	8,852	5,921	293,787		2	9
Mature		410		410	159	9,106			
All Upland	50	17,473	4,505	22,028	20,690	774,406		3	11
Stream (Hand)		9	139	148	193	12,966			
Stream (Chemical)		8	133	141	85	4,320	1,440		
All Stream		9	139	148	278	17,286			
All Types	50	17,482	4,644	22,176	20,968	791,692		3	11

TABLE 3A - FIRST WORKING

Eradication Type	Acres	Effective Man-Days	Total Ribes	Gallons Spray	Per Acre Basis			Ribes Remaining Per Acre	
					Man-Days	Ribes	Gallons Spray	Bushes	Live Stem
Reproduction	50	152	5,860		3.04	117			
TABLE 3B - SECOND WORKING									
Cutover (1940-1942)	211	147	6,191		.70	29		9	7
Cutover (Prior 1940)	2,338	2,641	172,662		1.13	74		6	22
Burn (Prior 1940)	20	42	377		2.10	19		6	37
Reproduction	6,729	6,251	168,518		.93	25		4	14
Pole	7,765	5,205	284,043		.67	37		3	10
Mature	410	159	9,106		.39	22			
All Upland	17,473	14,445	640,897		.83	37		4	13
Stream (Hand)	9	75	6,889		8.33	765			
Stream (Chemical)	8	27	1,440	480	3.38	180	60		
All Stream	9	102	8,329		11.33	925			
All Types	17,482	14,547	649,226		.83	37		4	13
TABLE 3C - THIRD WORKING									
Cutover (1940-1942)	54	42	7,811		.78	145		1	1
Reproduction	3,364	5,335	110,094		1.59	33		3	8
Pole	1,087	716	9,744		.66	9		2	5
All Upland	4,505	6,093	127,649		1.35	28		2	7
Stream (Hand)	139	118	6,077		.85	44			
Stream (Chemical)	133	58	2,880	960	.44	22	7		
All Stream	139	176	8,957		1.27	64			
All Types	4,644	6,269	136,606		1.35	29		2	7

TABLE 4

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1942
ST. JOE OPERATION

Working	Class	Acres	Effective Man-Days	Total Ribes	Gallons Spray	Per Acre Basis			Ribes Remaining Per Acre	
						Man-Days	Ribes	Gallons Per Sprayed Area	Bushes	Live Stem
First	FS-Reg.	50	152	5,860		3.04	117			
Second	EQ-Coop.	6,189	3,537	192,806		.57	31		3	14
	FS-Reg.	11,293	11,010	456,420	480	.97	40	60	4	12
	Total	17,482	14,547	649,226	480	.83	37	60	4	13
Third	FS-Reg.	4,644	6,269	136,606	960	1.35	29	7	2	7
All Workings	EQ-Coop.	6,189	3,537	192,806		.57	31		3	14
	FS-Reg.	15,987	17,431	598,886	1,440	1.09	37	10	4	11
	Total	22,176	20,968	791,692	1,440	.95	36	10	3	11

TABLE 5

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1942
ST. JOE OPERATION

State	Working	Number of Acres Worked																
		By Forest Service					By Bureau of Entomology and Plant Quarantine					Total						
												Federal			Other			
		Natl. For.	Pub. Dom.	State	Private	Total	Natl. For.	Pub. Dom.	State	Private	Total	Natl. For.	Pub. Dom.	Total	State	Private	Total	Total
Idaho	First	50				50						50		50				50
	Second	7,227	185	1,383	2,498	11,293	2,155	60	1,260	2,714	6,189	9,382	245	9,627	2,643	5,212	7,855	17,482
	Third	2,673	60	232	1,679	4,644						2,673	60	2,733	232	1,679	1,911	4,644
	Total	9,950	245	1,615	4,177	15,987	2,155	60	1,260	2,714	6,189	12,105	305	12,410	2,875	6,891	9,766	22,176

TABLE 6

TOTAL RIBES BY SPECIES ERADICATED, 1942
ST. JOE OPERATION

Working	Eradication Type	Acres	Ribes by Species				Total Ribes
			Ribes lacustre	Ribes viscosissimum	Ribes petiolare	Ribes inerme	
First	Reproduction	50	3,188	2,672			5,860
Second	Cutover (1940-1942)	811	4,089	2,102			6,191
	Cutover (Prior 1940)	2,338	114,138	57,800	712	12	172,662
	Burn (Prior 1940)	20	61	316			377
	Reproduction	6,729	103,476	58,607	465	5,970	168,518
	Pole	7,765	69,488	211,159	2,555	841	284,043
	Mature	410	645	8,461			9,106
	All Upland	17,473	291,897	338,445	3,732	6,823	640,897
	Stream	9	6,811		1,518		8,329
	All Types	17,482	298,708	338,445	5,250	6,823	649,226
Third	Cutover (1940-1942)	54	6,219	1,592			7,811
	Reproduction	3,364	64,485	44,819	567	223	110,094
	Pole	1,087	5,369	4,355	4	16	9,744
	All Upland	4,505	76,073	50,766	571	239	127,649
	Stream	139	3,608	42	5,307		8,957
	All Types	4,644	79,681	50,808	5,878	239	136,606
All Workings	Cutover (1940-1942)	265	10,308	3,694			14,002
	Cutover (Prior 1940)	2,338	114,138	57,800	712	12	172,662
	Burn (Prior 1940)	20	61	316			377
	Reproduction	10,143	171,149	106,098	1,032	6,193	284,472
	Pole	8,852	74,857	215,514	2,559	857	293,787
	Mature	410	645	8,461			9,106
	All Upland	22,028	371,158	391,883	4,303	7,062	774,406
	Stream	148	10,419	42	6,825		17,256
	All Types	22,176	381,577	391,925	11,128	7,062	791,692

SUMMARY OF RIBES ERADICATION, 1929-1942
ST. JOE OPERATION

TABLE 7 - SUMMARY OF ALL WORKINGS

Eradication Type	Acres First Working	Acres Second Working	Acres Third Working	Total Acres	Effective Man-Days	Total Ribes	Gallons Spray
Cutover (1940-1942)		211	54	265	189	14,002	
Cutover (Prior 1940)	1,009	2,682	230	3,921	4,202	503,959	
Burn (Prior 1940)		20		20	42	377	
Reproduction	217,890	77,687	9,146	304,723	347,013	90,701,936	
Pole	86,838	34,143	2,185	123,166	54,220	9,078,718	
Mature	192,059	10,797	170	203,026	87,223	22,823,872	
Brush	2,452	431		2,883	1,924	679,187	
Subalpine	200			200	416	90,809	
All Upland	500,448	125,971	11,785	638,204	495,229	123,892,860	
Stream (Hand)	34,678	12,611	6,371	53,660	97,527	27,341,323	
Stream (Chemical)	7,404	3,245	739	11,388	26,977	2,390,100	796,700
Stream (Mechanical)	791	27		818	10,420	409,100	
All Stream	35,469	12,638	6,371	54,478	134,924	30,140,523	
All Types	535,917	138,609	18,156	692,682	630,153	154,033,383	

TABLE 7A - FIRST WORKING

Eradication Type	Acres	Effective Man-Days	Total Ribes	Gallons Spray	Per Acre Basis Man-Days	Ribes	Gallons Spray
Cutover (Prior 1940)	1,009	654	100,332		.65	99	
Reproduction	217,890	242,526	81,205,877		1.11	373	
Pole	86,838	33,082	7,790,055		.38	90	
Mature	192,059	78,643	21,688,812		.41	113	
Brush	2,452	1,981	676,620		.77	276	
Subalpine	200	416	90,809		2.08	454	
All Upland	500,448	357,202	111,542,505		.71	223	
Stream (Hand)	34,678	65,337	20,953,990		1.88	604	
Stream (Chemical)	7,404	21,683	2,009,118	669,706	2.93	271	90
Stream (Mechanical)	791	10,101	395,600		12.77	500	
All Stream	35,469	97,121	23,358,708		2.74	659	
All Types	535,917	454,323	134,901,213		.85	252	

TABLE 7B - SECOND WORKING

Cutover (1940-1942)	211	147	6,191		.70	29	
Cutover (Prior 1940)	2,682	3,009	342,166		1.12	128	
Burn (Prior 1940)	20	42	377		2.10	19	
Reproduction	77,687	91,330	9,032,979		1.18	116	
Pole	34,143	19,873	1,270,306		.58	37	
Mature	10,797	8,255	1,097,018		.76	102	
Brush	431	43	2,567		.10	6	
All Upland	125,971	122,699	11,751,604		.97	93	
Stream (Hand)	12,611	22,464	4,843,003		1.78	384	
Stream (Chemical)	3,245	4,731	334,989	111,663	1.46	103	34
Stream (Mechanical)	27	319	13,500		11.81	500	
All Stream	12,638	27,514	5,191,492		2.18	411	
All Types	138,609	150,213	16,943,096		1.08	122	

TABLE 7C - THIRD WORKING

Cutover (1940-1942)	54	42	7,811		.78	145	
Cutover (Prior 1940)	230	539	61,461		2.34	267	
Reproduction	9,146	13,157	463,080		1.44	51	
Pole	2,185	1,265	28,357		.58	13	
Mature	170	325	38,042		1.91	224	
All Upland	11,785	15,328	598,751		1.30	51	
Stream (Hand)	6,371	9,726	1,544,330		1.53	242	
Stream (Chemical)	739	563	45,993	15,331	.76	62	21
All Stream	6,371	10,289	1,590,323		1.61	250	
All Types	18,156	25,617	2,189,074		1.41	121	

TABLE 8

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1929-1942
ST. JOE OPERATION

Working	Class	Acres	Effective Man-Days	Total Ribes	Gallons Spray	Per Acre Basis		
						Man-Days	Ribes	Gallons Per Sprayed Area
First	EQ-Coop.	17,073	13,484	3,864,001	56,611	.79	226	41
	EQ-Emerg.	189,429	118,249	37,196,488	63,506	.62	196	101
	FS-Reg.	86,539	90,374	26,041,309	262,145	1.04	301	95
	FS-Emerg.	70,981	45,138	15,333,106	101,476	.64	216	129
	CCC	171,895	187,078	52,466,309	185,968	1.09	305	101
	Total	535,917	454,323	134,901,213	669,706	.85	252	90
Second	EQ-Coop.	9,329	6,532	361,985	2,674	.70	39	11
	EQ-Emerg.	42,097	36,727	5,940,959	10,557	.87	141	32
	FS-Reg.	69,435	73,802	6,868,176	40,191	1.06	99	25
	CCC	17,748	33,152	3,771,976	58,241	1.87	213	55
	Total	138,609	150,213	16,943,096	111,663	1.08	122	34
Third	EQ-Emerg.	2,993	2,922	455,940	3,025	.98	152	12
	FS-Reg.	12,564	17,580	1,081,116	7,809	1.40	86	20
	CCC	2,599	5,115	652,018	4,497	1.97	251	46
	Total	18,156	25,617	2,189,074	15,331	1.41	121	21
All Workings	EQ-Coop.	26,402	20,016	4,225,986	59,285	.76	160	36
	EQ-Emerg.	234,519	157,898	43,593,387	77,088	.67	186	64
	FS-Reg.	168,538	181,756	33,990,601	310,145	1.08	202	65
	FS-Emerg.	70,981	45,138	15,333,106	101,476	.64	216	129
	CCC	192,242	225,345	56,890,303	248,706	1.17	296	83
	Total	692,682	630,153	154,033,383	796,700	.91	222	70

TABLE 9

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1929-1942
ST. JOE OPERATION

Working	Number of Acres Worked						
	Federal			Other			Total
	National Forest	Public Domain	Total	State	Private	Total	
First	216,208	12,578	228,786	67,082	240,049	307,131	535,917
Second	74,715	4,889	79,604	16,694	42,311	59,005	138,609
Third	9,734	190	9,924	1,615	6,617	8,232	18,156
Total	300,657	17,657	318,314	85,391	288,977	374,368	692,682

TABLE 10

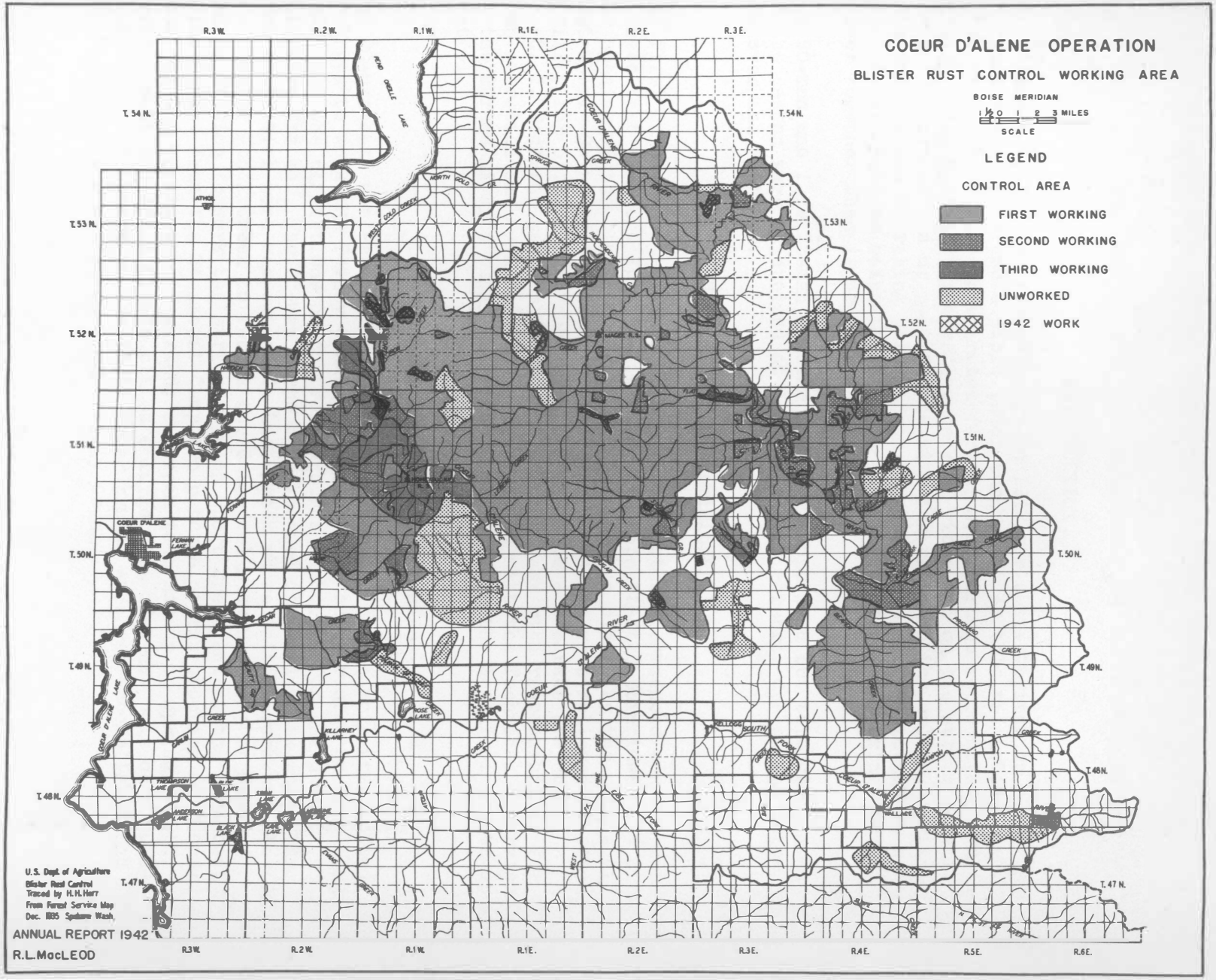
PROGRESS OF FIRST WORKING BY OWNERSHIP CLASSES, 1929-1942
ST. JOE OPERATION

Ownership Class	Number of Acres			Acres on Which Working is Deferred	Total Acres White Pine
	Worked	Unworked	Total		
National Forest	216,208	84,783	300,991	11,089	312,080
Public Domain	12,578	10,847	23,425	1,040	24,465
Subtotal Federal	228,786	95,630	324,416	12,129	336,545
State	67,082	26,973	94,055	20,880	114,935
Private	240,049	135,945	375,994	57,451	433,445
Subtotal Other	307,131	162,918	470,049	78,331	548,380
Total	535,917	258,548	794,465	90,460	884,925

TABLE 11

TOTAL RIBES BY SPECIES ERADICATED, 1929-1942
ST. JOE OPERATION

Working	Eradication Type	Acres	Ribes by Species						Total Ribes
			Ribes lacustre	Ribes viscosissimum	Ribes petiolare	Ribes inerme	Ribes irriguum	Ribes triste	
First	Cutover (Prior 1940)	1,009	64,897	30,125	5,269	41			100,332
	Reproduction	217,890	15,252,226	65,332,727	121,897	344,709	154,318		81,205,877
	Pole	86,838	3,234,919	4,383,484	21,170	63,499	76,983		7,780,055
	Mature	192,059	10,956,325	10,404,806	28,217	42,519	256,945		21,688,812
	Brush	2,452	93,470	579,731	1,987	1,432			676,620
	Subalpine	200	54,975	35,834					90,809
	All Upland	500,448	29,656,812	80,766,707	178,540	452,200	488,246		111,542,505
	Stream	35,469	16,372,384	888,029	3,331,826	2,749,642	16,695	132	23,358,708
	All Types	535,917	46,029,196	81,654,736	3,510,366	3,201,842	504,941	132	134,901,213
Second	Cutover (1940-1942)	211	4,089	2,102					6,191
	Cutover (Prior 1940)	2,682	127,379	213,886	729	172			342,166
	Burn (Prior 1940)	20	61	316					377
	Reproduction	77,687	3,410,388	5,517,636	35,104	58,273	11,578		9,032,979
	Pole	34,143	555,353	691,608	4,858	18,483	4		1,270,306
	Mature	10,797	487,781	576,618	778	19	31,822		1,097,018
	Brush	431	456	2,111					2,567
	All Upland	125,971	4,585,507	7,004,277	41,469	76,947	43,404		11,751,604
	Stream	12,638	3,045,535	163,110	1,081,834	753,469	6,073	141,471	5,191,492
	All Types	138,609	7,631,042	7,167,387	1,123,303	830,416	49,477	141,471	16,943,096
Third	Cutover (1940-1942)	54	6,219	1,592					7,811
	Cutover (Prior 1940)	230	15,343	43,297		2,821			61,461
	Reproduction	9,146	197,858	251,779	6,359	7,084			463,080
	Pole	2,185	11,892	16,354	42	69			28,357
	Mature	170	32,990	3,316	8		1,728		38,042
	All Upland	11,785	264,302	316,338	6,409	9,974	1,728		598,751
	Stream	6,371	725,425	23,027	469,363	370,126		2,382	1,590,323
	All Types	18,156	989,727	339,365	475,772	380,100	1,728	2,382	2,189,074
All Workings	Cutover (1940-1942)	265	10,308	3,694					14,002
	Cutover (Prior 1940)	3,921	207,619	287,308	5,998	3,034			503,959
	Burn (Prior 1940)	20	61	316					377
	Reproduction	304,723	18,860,472	71,102,142	163,360	410,066	165,896		90,701,936
	Pole	123,166	3,802,164	5,091,446	26,070	82,051	76,987		9,078,718
	Mature	203,026	11,477,096	10,984,740	29,003	42,538	290,495		22,823,872
	Brush	2,883	93,926	581,842	1,987	1,432			679,187
	Subalpine	200	54,975	35,834					90,809
	All Upland	638,204	34,506,621	88,087,322	226,418	539,121	533,378		123,892,860
	Stream	54,478	20,143,344	1,074,166	4,883,023	3,873,237	22,768	143,985	30,140,523
	All Types	692,682	54,649,965	89,161,488	5,109,441	4,412,358	556,146	143,985	154,033,383


COEUR D'ALENE OPERATION
BLISTER RUST CONTROL WORKING AREA
BOISE MERIDIAN
1½ 0 1 2 3 MILES
SCALE
LEGEND
CONTROL AREA
FIRST WORKING
SECOND WORKING
THIRD WORKING
UNWORKED
1942 WORK
R.3W.
R.2W.
R.1W.
R.1E.
R.2E.
R.3E.
R.4E.
R.5E.
R.6E.
T.54N.
T.53N.
T.52N.
T.51N.
T.50N.
T.49N.
T.48N.
T.47N.
COEUR D'ALENE
ATHOL
KIDD ISLAND
KIDD GRELLE LAKE
LAKE COEUR D'ALENE
FERNAN LAKE
KILLARNEY LAKE
ROSE LAKE
THOMPSON LAKE
ANDERSON LAKE
BLUE LAKE
CAVE LAKE
SIMM LAKE
HAYDEN LAKE
HAUSER LAKE
NORTH GOLD CR.
EAST GOLD CREEK
SPRUCE CREEK
COEUR D'ALENE RIVER
ST. JOE RIVER
COEUR D'ALENE CREEK
LATOUR CREEK
PRICHARD CREEK
KELLOGG SOUTH FORK
WALLACE
U.S. Dept. of Agriculture
Blister Rust Control
Traced by H.N. Herr
From Forest Service Map
Dec. 1935 Spokane Wash.
ANNUAL REPORT 1942
R.L. MacLEOD

BLISTER RUST CONTROL WORK, COEUR D'ALENE OPERATION, 1942

By
Robert L. MacLeod, Associate Pathologist
Neal D. Nelson, Assistant Forest Supervisor, U. S. Forest Service

INTRODUCTION

White pine blister rust control work in 1942 was characterized by a shortage of experienced labor and a rapid labor turnover. As this was anticipated, ribes eradication was concentrated for the most part on reproduction and planted areas with the greatest numbers of ribes and on the stream zone in advanced reproduction or pole stands with few ribes in the upland. While this was a sound operating policy from the standpoint of protection it was also advantageous in maintaining close supervision through working crews closer together than is normally necessary.

One 90-man and five 35-man regular camps were operated but throughout most of the season were maintained at less than full strength due to the labor turnover and shortage.

ORGANIZATION AND ADMINISTRATION

The first camp was established on May 11; the others commenced control work between that time and June 23. Closing of camps started coincidentally with the opening of the high schools; the last camp was closed by the middle of September. Owing to the labor situation the rangers were relieved of responsibility for blister rust control which was made a separate project. Mr. C. J. Pederson was employed as Unit Supervisor with responsibility for camp operation and worked in close cooperation with the Technical Supervisor of the Bureau of Entomology and Plant Quarantine on the technical phases of control.

LOCATION AND DESCRIPTION OF AREAS

The 90-man camp was established on Hudlow Creek. The men were transported by truck to work the Barney Creek plantation, the cutover area on Lewelling Creek and the plantations on controlled burns on Honey, Tom Lavin and Solitaire Creeks. The 35-man camps were located on Trail Creek where the area of initial work was extended; Lost Creek where initial work was started; the head of Ethel Creek to rework the Cathedral Lookout area; at Magee Ranger Station to work the stream zone on Short Creek and at the Steamboat Spike Camp. From the Steamboat Camp two patches of reproduction on Steamboat and Can Creeks were reworked; a stream zone mop-up on Spring, Smith, French, Matt and Falls Creeks placed a large area of dense pole on a maintenance basis; rework on the Scott Creek pruned area was accomplished and the third working was started on Grizzly Creek.

CHECKING

A checking party of four men, working together, performed all of the regular and post check work. These men spent all of their time throughout the season on checking work. Under conditions obtaining in 1942 they were able to perform the regular check as required in various camp areas; intervening periods were spent on post check. Stocking data were taken on all post check strips.

No pine disease survey work was performed in 1942. Timing is important in this phase of the work. Weather conditions in 1941 coupled with the fact that cankers of 1937 and some of 1938 origin were producing aecia made 1941 a favorable year for rust spread and intensification. Much more significance could therefore be attached to the results of survey work performed in the fall of 1942 or later than to the results of any disease work performed in 1942.

ORGANIZATION

Only regular Forest Service camps were established for blister rust control. A peak of 245 men and four checkers were employed in six camps with supervision as follows:

Bureau of Entomology and Plant Quarantine	U. S. Forest Service
R. L. MacLeod, Technical Supervisor	Neal D. Nelson, Forest Officer C. J. Pederson, Unit Supervisor

STATEMENT OF EXPENDITURES AND COSTS

The statement of expenditures and costs is shown in the following tables:

TABLE 1

EXPENDITURES BY APPROPRIATIONS, CALENDAR YEAR 1942
COEUR D'ALENE OPERATION

Cooperating Agency	Appropriation	Amount
Bureau of Entomology and Plant Quarantine	Regular BLR-1-4	$ 3,525.13
Forest Service	Regular BLR-4	95,946.18
Total		$99,471.31

TABLE 2

CLASSIFIED EXPENDITURES, CALENDAR YEAR 1942
COEUR D'ALENE OPERATION

Item	Bureau of Entomology and Plant Quarantine Regular BLR-1-4	Forest Service Regular BLR-4	Total
Sal. perm. men	$3,388.15	$ 6,555.00	$ 9,943.15
Sal. temp. men		10,816.40	10,816.40
Wages, temp. labs.		59,928.52	59,928.52
Subs. supplies		16,159.26	16,159.26
Equipment		174.73	174.73
Travel & transp.	131.92	635.38	767.30
Twine		216.00	216.00
Other Supplies	5.06	1,460.89	1,465.95
Total	$3,525.13	$95,946.18	$99,471.31

TABLE 2A

DISTRIBUTION OF EXPENDITURES BY PROJECTS, 1942
COEUR D'ALENE OPERATION

Project	Expenditures	Number Effective Man-Days	Effective Man-Day Cost
Planning, Coordination and Technical Direction BEPQ Regular BLR-1-4	$ 3,525.13		
National Forest Lands Forest Service Regular BLR-4	$95,946.18	7,478	$12.83

	Forest Service
Number meals served	47,238
Average cost per meal	$0.342
Pounds of twine	1,000

SUMMARY OF RIBES ERADICATION, 1942
COEUR D'ALENE OPERATION

TABLE 3 - SUMMARY OF ALL WORKINGS

Eradication Type	Acres First Working	Acres Second Working	Acres Third Working	Total Acres	Effective Man-Days	Total Ribes	Ribes Remaining Per Acre	
							Bushes	Live Stem
Cutover (Prior 1940)	41	210		251	330	19,401	8.4	6.4
Burn (Prior 1940)	270	762		1,032	3,107	474,938	17.1	20.5
Reproduction	639	537	164	1,340	2,333	129,043	2.6	5.5
Pole		19		19	22	201	0	0
All Upland	950	1,528	164	2,642	5,792	623,583	8.8	11.2
Stream (Zone)	164	333		497	1,686	118,835	4.2	10.9
All Types	1,114	1,861	164	3,139	7,478	742,418	7.4	11.1

TABLE 3A - FIRST WORKING

Eradication Type	Acres	Effective Man-Days	Total Ribes	Per Acre Basis		Ribes Remaining Per Acre	
				Man-Days	Ribes	Bushes	Live Stem
Cutover (Prior 1940)	41	25	2,945	.61	72	2.3	1.8
Burn (Prior 1940)	270	1,046	274,709	3.88	1,017	31.4	42.0
Reproduction	639	889	67,939	1.39	106	2.5	4.0
All Upland	950	1,960	345,593	2.06	364	13.9	20.2
Stream (Zone)	164	1,045	85,569	6.37	522	7.6	16.3
All Types	1,114	3,005	431,162	2.70	387	11.5	18.9
TABLE 3B - SECOND WORKING							
Cutover (Prior 1940)	210	305	16,456	1.45	78	9.6	7.4
Burn (Prior 1940)	762	2,061	200,229	2.70	263	9.1	8.3
Reproduction	537	1,110	58,038	2.07	108	2.9	5.1
Pole	19	22	201	1.16	11		
All Upland	1,528	3,498	274,924	2.29	180	6.6	6.7
Stream (Zone)	333	641	33,266	1.92	100	2.3	7.8
All Types	1,861	4,139	308,190	2.22	166	5.1	7.1
TABLE 3C - THIRD WORKING							
Reproduction	164	334	3,066	2.04	19	1.6	3.2

TABLE 4

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1942
COEUR D'ALENE OPERATION

State	Working	Number of Acres Worked By Forest Service		
		National Forest	Private	Total
Idaho	First	1,114		1,114
	Second	1,580	281	1,861
	Third	164		164
	Total	2,858	281	3,139

TABLE 5

TOTAL RIBES BY SPECIES ERADICATED, 1942
COEUR D'ALENE OPERATION

Working	Eradication Type	Acres	Ribes by Species			Total Ribes
			Ribes lacustre	Ribes viscosissimum	Ribes inerme	
First	Cutover (Prior 1940)	41	2,272	673		2,945
	Burn (Prior 1940)	270	216,466	58,243		274,709
	Reproduction	639	67,224	713	2	67,939
	All Upland	950	285,962	59,629	2	345,593
	Stream	164	74,714	998	9,857	85,569
	All Types	1,114	360,676	60,627	9,859	431,162
Second	Cutover (Prior 1940)	210	16,055	401		16,456
	Burn (Prior 1940)	762	148,519	51,710		200,229
	Reproduction	537	50,413	7,625		58,038
	Pole	19	31	170		201
	All Upland	1,528	215,018	59,906		274,924
	Stream	333	19,581	438	13,247	33,266
	All Types	1,861	234,599	60,344	13,247	308,190
Third	Reproduction	164	1,665	1,401		3,066
All Workings	Cutover (Prior 1940)	251	18,327	1,074		19,401
	Burn (Prior 1940)	1,032	364,985	109,953		474,938
	Reproduction	1,340	119,302	9,739	2	129,043
	Pole	19	31	170		201
	All Upland	2,642	502,645	120,936	2	623,583
	Stream	497	94,295	1,436	23,104	118,835
	All Types	3,139	596,940	122,372	23,106	742,418

SUMMARY OF RIBES ERADICATION, 1927-1942
COEUR D'ALENE OPERATION

TABLE 6 - SUMMARY OF ALL WORKINGS

Eradication Type	Acres First Working	Acres Second Working	Acres Third Working	Total Acres	Effective Man-Days	Total Ribes
Cutover (Prior 1940)	11,914	7,539	3,961	23,414	33,854	6,836,117
Burn (Prior 1940)	5,889	1,161		7,050	7,596	1,609,206
Reproduction	83,401	15,600	2,043	101,044	162,198	21,842,784
Pole	66,032	5,801	825	72,658	36,112	5,243,650
Mature	141,857	10,893	1,826	154,576	97,847	15,457,157
Brush	10,555	507		11,062	15,717	2,332,028
Subalpine	485			485	283	76,762
Meadow-Field	157			157		
All Upland	320,290	41,501	8,655	370,446	353,607	53,397,704
Stream (Hand)	13,204	4,429	1,181	18,814	59,270	12,313,781
Stream (Mechanical)	1,123	100		1,223	6,830	634,731
Stream (Zone)	372	2,810		3,182	3,825	346,168
All Stream	14,699	7,339	1,181	23,219	69,925	13,294,680
All Types	334,989	48,840	9,836	393,665	423,532	66,692,384

TABLE 6A - FIRST WORKING

Eradication Type	Acres	Effective Man-Days	Total Ribes	Per Acre Basis Man-Days	Per Acre Basis Ribes
Cutover (Prior 1940)	11,914	16,605	4,448,118	1.39	373
Burn (Prior 1940)	5,889	4,555	1,028,668	.77	175
Reproduction	83,401	133,114	19,743,306	1.60	237
Pole	66,032	31,587	4,519,399	.48	68
Mature	141,857	88,242	14,210,671	.62	100
Brush	10,555	14,983	2,234,161	1.42	212
Subalpine	485	283	76,762	.58	158
Meadow-Field	157				
All Upland	320,290	289,369	46,261,085	.90	144
Stream (Hand)	13,204	48,747	10,965,233	3.69	830
Stream (Mechanical)	1,123	5,956	587,434	5.30	523
Stream (Zone)	372	1,315	141,227	3.53	380
All Stream	14,699	56,018	11,693,894	3.81	796
All Types	334,989	345,387	57,954,979	1.03	173

TABLE 6B - SECOND WORKING

Cutover (Prior 1940)	7,539	11,353	1,837,579	1.51	244
Burn (Prior 1940)	1,161	3,041	580,538	2.62	500
Reproduction	15,600	25,433	1,897,617	1.63	122
Pole	5,801	3,781	611,121	.65	105
Mature	10,893	8,656	1,136,596	.79	104
Brush	507	734	97,867	1.45	193
All Upland	41,501	52,998	6,161,318	1.28	148
Stream (Hand)	4,429	9,154	1,253,205	2.07	283
Stream (Mechanical)	100	874	47,294	8.74	473
Stream (Zone)	2,810	2,510	204,941	.89	73
All Stream	7,339	12,538	1,505,440	1.71	205
All Types	48,840	65,536	7,666,758	1.34	157

TABLE 6C - THIRD WORKING

Cutover (Prior 1940)	3,961	5,896	550,420	1.49	139
Reproduction	2,043	3,651	201,861	1.79	99
Pole	825	744	113,130	.90	137
Mature	1,826	949	109,890	.52	60
All Upland	8,655	11,240	975,301	1.30	113
Stream (Hand)	1,181	1,369	95,346	1.16	81
All Types	9,836	12,609	1,070,647	1.28	109

TABLE 7

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1927-1942
COEUR D'ALENE OPERATION

Working	Class	Acres	Effective Man-Days	Total Ribes	Per Acre Basis	
					Man-Days	Ribes
First	EQ-Reg.	25,776	8,351	2,846,383	.32	110
	EQ-Emerg.	40,997	35,497	6,584,066	.87	161
	FS-Reg.	40,385	44,597	8,802,599	1.10	218
	FS-Emerg.	102,088	78,912	16,462,983	.77	161
	CCC	125,743	178,030	23,258,948	1.42	185
	Total	334,989	345,387	57,954,979	1.03	173
Second	EQ-Emerg.	42	44	5,151	1.05	123
	FS-Reg.	21,215	23,289	4,057,497	1.10	191
	FS-Emerg.	9,136	7,735	1,132,792	.85	124
	CCC	18,447	34,468	2,471,318	1.87	134
	Total	48,840	65,536	7,666,758	1.34	157
Third	FS-Reg.	5,268	4,855	631,056	.92	120
	FS-Emerg.	487	250	24,398	.51	50
	CCC	4,081	7,504	415,193	1.84	102
	Total	9,836	12,609	1,070,647	1.28	109
All Workings	EQ-Reg.	25,776	8,351	2,846,383	.32	110
	EQ-Emerg.	41,039	35,541	6,589,217	.87	161
	FS-Reg.	66,868	72,741	13,491,152	1.09	202
	FS-Emerg.	111,711	86,897	17,620,173	.78	158
	CCC	148,271	220,002	26,145,459	1.48	176
	Total	393,665	423,532	66,692,384	1.08	169

TABLE 8

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1927-1942
COEUR D'ALENE OPERATION

Working	Number of Acres Worked				
	Federal	Other			Total
	National Forest	State	Private	Total	
First	314,180	5,659	15,150	20,809	334,989
Second	45,086	530	3,224	3,754	48,840
Third	8,743	200	893	1,093	9,836
All Workings	368,009	6,389	19,267	25,656	393,665

TABLE 9

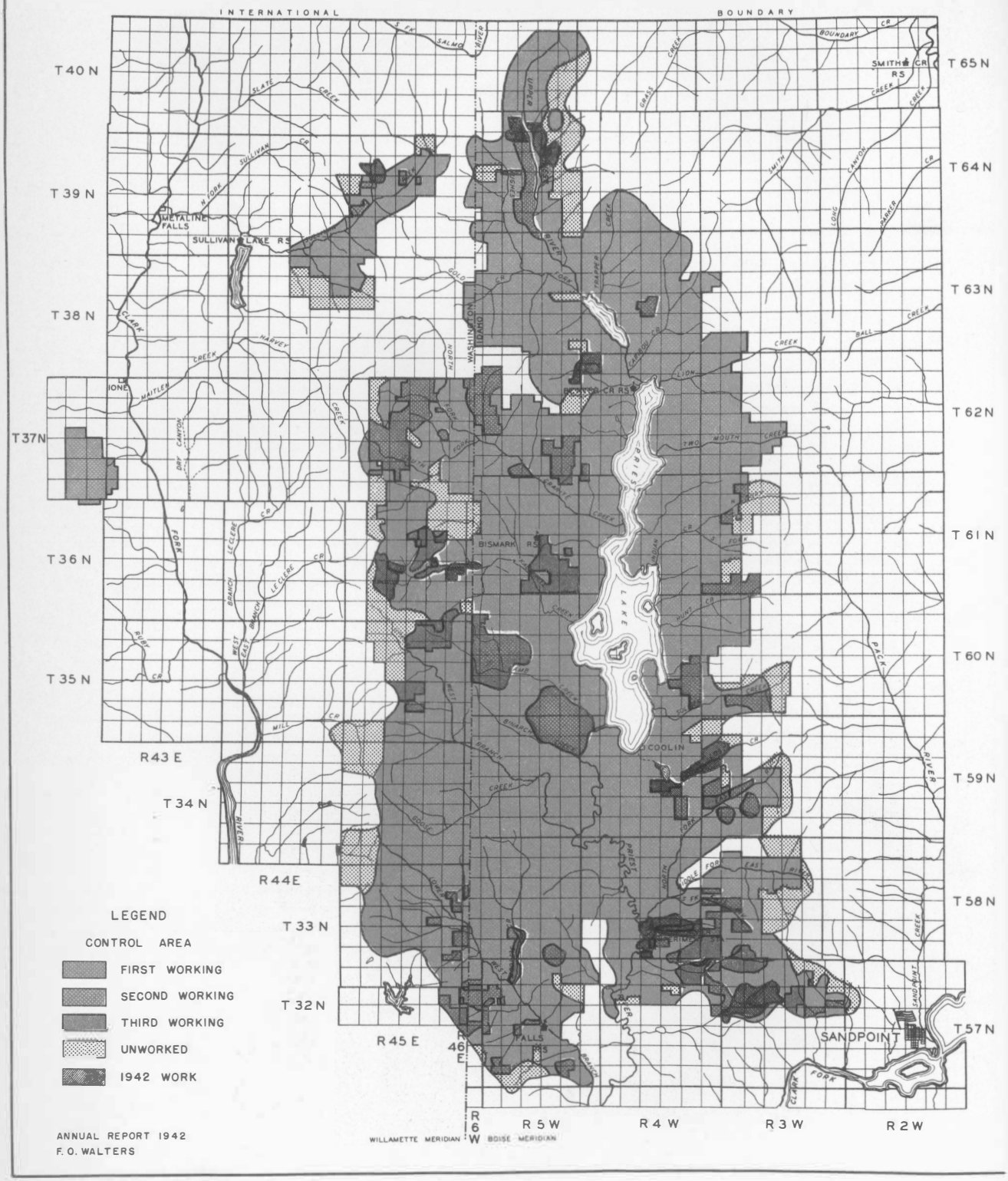
PROGRESS OF FIRST WORKING BY OWNERSHIP CLASSES, 1927-1942
COEUR D'ALENE OPERATION

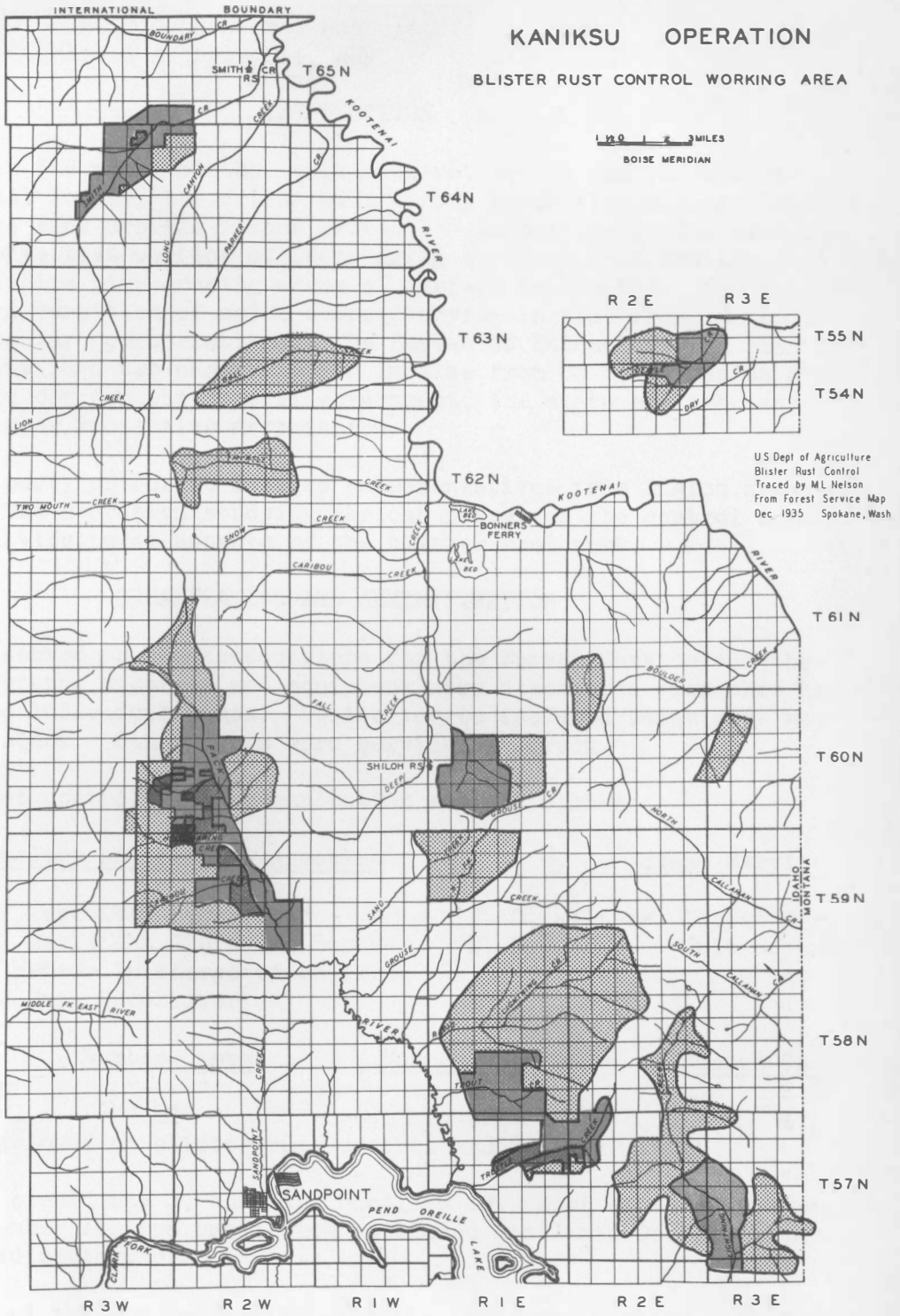
Ownership Class	Number of Acres			Acres on Which Working Is Deferred	Total Acres White Pine
	Worked	Unworked	Total		
National Forest	314,180	33,522	347,702	10,303	358,005
Public Domain		2,110	2,110		2,110
Subtotal Federal	314,180	35,632	349,812	10,303	360,115
State	5,659	1,171	6,830		6,830
Private	15,150	8,349	23,499	5,151	28,650
Subtotal Other	20,809	9,520	30,329	5,151	35,480
Total	334,989	45,152	380,141	15,454	395,595

TABLE 10

TOTAL RIBES BY SPECIES ERADICATED, 1927-1942
COEUR D'ALENE OPERATION

Working	Eradication Type	Acres	Ribes by Species					Total Ribes
			Ribes lacustre	Ribes viscosissimum	Ribes petiolare	Ribes inerme	Ribes irriguum	
First	Cutover (Prior 1940)	11,914	3,050,950	1,352,046	1	17,536	27,585	4,448,118
	Burn (Prior 1940)	5,889	561,147	448,567		13,530	5,424	1,028,668
	Reproduction	83,401	11,777,963	7,357,154	2,227	504,581	101,381	19,743,306
	Pole	66,032	2,651,127	1,799,863	12,246	12,823	43,340	4,519,399
	Mature	141,857	11,053,700	2,917,046	1	89,402	150,522	14,210,671
	Brush	10,555	778,322	1,424,834		25,748	5,257	2,234,161
	Subalpine	485	55,561	21,201				76,762
	Meadow-Field	157						
	All Upland	320,290	29,928,770	15,320,711	14,475	663,620	333,509	46,261,085
	Stream	14,699	7,182,011	183,127	31,474	4,228,895	68,387	11,693,894
	All Types	334,989	37,110,781	15,503,838	45,949	4,892,515	401,896	57,954,979
Second	Cutover (Prior 1940)	7,539	1,417,735	403,334		13,430	3,080	1,837,579
	Burn (Prior 1940)	1,161	410,973	169,565				580,538
	Reproduction	15,600	1,033,669	842,295		12,818	8,835	1,897,617
	Pole	5,801	477,739	124,199	4,736	3,882	565	611,121
	Mature	10,893	819,635	301,535		11,089	4,337	1,136,596
	Brush	507	11,517	86,350				97,867
	All Upland	41,501	4,171,268	1,927,278	4,736	41,219	16,817	6,161,318
	Stream	7,339	1,046,088	43,715		409,636	6,001	1,505,440
	All Types	48,840	5,217,356	1,970,993	4,736	450,855	22,818	7,666,758
Third	Cutover (Prior 1940)	3,961	471,005	79,415				550,420
	Reproduction	2,043	131,165	69,629		1,067		201,861
	Pole	825	102,407	10,723				113,130
	Mature	1,826	95,320	14,570				109,890
	All Upland	8,655	799,897	174,337		1,067		975,301
	Stream	1,181	67,556	113		27,677		95,346
	All Types	9,836	867,453	174,450		28,744		1,070,647
All Workings	Cutover (Prior 1940)	23,414	4,939,690	1,834,795	1	30,966	30,665	6,836,117
	Burn (Prior 1940)	7,050	972,120	618,132		13,530	5,424	1,609,206
	Reproduction	101,044	12,942,797	8,269,078	2,227	518,466	110,216	21,842,784
	Pole	72,658	3,231,273	1,934,785	16,982	16,705	43,905	5,243,650
	Mature	154,576	11,968,655	3,233,151	1	100,491	154,859	15,457,157
	Brush	11,062	789,839	1,511,184		25,748	5,257	2,332,028
	Subalpine	485	55,561	21,201				76,762
	Meadow-Field	157						
	All Upland	370,446	34,899,935	17,422,326	19,211	705,906	350,326	53,397,704
	Stream	23,219	8,295,655	226,955	31,474	4,666,208	74,388	13,294,680
	All Types	393,665	43,195,590	17,649,281	50,685	5,372,114	424,714	66,692,384


INTERNATIONAL BOUNDARY
T40N
T39N
T38N
T37N
T36N
T35N
T34N
T33N
T32N
T65N
T64N
T63N
T62N
T61N
T60N
T59N
T58N
T57N
R43E
R44E
R45E
R46E
R6W
R5W
R4W
R3W
R2W
METALINE FALLS
SULLIVAN LAKE RS
BISMARK RS
SMITH CR RS
COOLIN
SANDPOINT
PRIEST LAKE
PEND OREILLE RIVER
CLARK FORK
WASHINGTON IDAHO
LEGEND
CONTROL AREA
FIRST WORKING
SECOND WORKING
THIRD WORKING
UNWORKED
1942 WORK
ANNUAL REPORT 1942
F. O. WALTERS
WILLAMETTE MERIDIAN
BOISE MERIDIAN


KANIKSU OPERATION
BLISTER RUST CONTROL WORKING AREA
0 1 2 3 MILES
BOISE MERIDIAN
U.S. Dept of Agriculture
Blister Rust Control
Traced by M.L. Nelson
From Forest Service Map
Dec. 1935 Spokane, Wash
INTERNATIONAL BOUNDARY
T65N
T64N
T63N
T62N
T61N
T60N
T59N
T58N
T57N
R3W
R2W
R1W
R1E
R2E
R3E
T55N
T54N
SMITH RS
BONNERS FERRY
SHILOH RS
SANDPOINT
PEND OREILLE LAKE
KOOTENAI RIVER
IDAHO MONTANA
MIDDLE FK EAST RIVER
CLARK FORK

BLISTER RUST CONTROL WORK, KANIKSU OPERATION, 1942

By
Frank O. Walters, Associate Pathologist
Harold A. Brischle, Assistant Pathologist

INTRODUCTION

Included within the scope of the Kaniksu operation are the lands of the Kaniksu National Forest, the Priest Lake Timber Protective Association and portions of the Pend Oreille Timber Protective Association. The area included represents that portion of Idaho lying north of Pend Oreille Lake and the principal white pine growing areas of eastern Washington. The Forest Service program consisted of seven camps, varying in size from 12 to 50 men, financed by regular appropriations. The Bureau of Entomology and Plant Quarantine maintained two camps varying in size from 30 to 50 men on a cooperative basis between the federal government, the state of Idaho and the Priest Lake Timber Protective Association.

In October, a party of Forest Service representatives from Region Six spent three days on the operation studying various phases of the control work as well as the silvicultural aspects of the blister rust work.

ORGANIZATION AND ADMINISTRATION

Kalispell Bay served as the headquarters for the Forest Service and the Bureau. Subsistence supplies and equipment were dispatched from this headquarters to the individual camps. Deliveries to isolated camps were made by boat and pack stock. Other camps were serviced by truck.

The blister rust control field organization was as follows:

Bureau of Entomology and Plant Quarantine		U. S. Forest Service	
F. O. Walters,	Technical Supervisor	F. O. Walters,	Forest Service
H. A. Brischle,	Assistant Operation Supervisor in charge of checking	W. D. McKee,	Unit Supervisor
L. J. Easley,	Unit Supervisor		

Program	Number Camps	Number Workers	Number Checkers
EQ-Cooperative	2	80	2
FS-Regular	7	271	4

Total number employed on blister rust control - 357

The first camp opened May 3, the last one June 18. Most of the camps were closed by September 1. One small crew continued until mid-October with stream type eradication.

Due to demands of the war industries suitable labor was difficult to secure. In addition, adverse weather conditions during the first part of the field season combined to make the labor situation even more acute. As a result, accomplishment was far behind normal schedule. These factors together with an increased wage scale and a considerable advance in food costs contributed to an increase in man-day costs.

BLISTER RUST CONTROL WORK, KANIKSU OPERATION, 1942

By
Frank O. Walters, Associate Pathologist
Harold A. Brischle, Assistant Pathologist

INTRODUCTION

Included within the scope of the Kaniksu operation are the lands of the Kaniksu National Forest, the Priest Lake Timber Protective Association and portions of the Pend Oreille Timber Protective Association. The area included represents that portion of Idaho lying north of Pend Oreille Lake and the principal white pine growing areas of eastern Washington. The Forest Service program consisted of seven camps, varying in size from 12 to 50 men, financed by regular appropriations. The Bureau of Entomology and Plant Quarantine maintained two camps varying in size from 30 to 50 men on a cooperative basis between the federal government, the state of Idaho and the Priest Lake Timber Protective Association.

In October, a party of Forest Service representatives from Region Six spent three days on the operation studying various phases of the control work as well as the silvicultural aspects of the blister rust work.

ORGANIZATION AND ADMINISTRATION

Kalispell Bay served as the headquarters for the Forest Service and the Bureau. Subsistence supplies and equipment were dispatched from this headquarters to the individual camps. Deliveries to isolated camps were made by boat and pack stock. Other camps were serviced by truck.

The blister rust control field organization was as follows:

Bureau of Entomology and Plant Quarantine		U. S. Forest Service	
F. O. Walters,	Technical Supervisor	F. O. Walters,	Forest Service
H. A. Brischle,	Assistant Operation Supervisor in charge of checking	W. D. McKee,	Unit Supervisor
L. J. Easley,	Unit Supervisor		

Program	Number Camps	Number Workers	Number Checkers
EQ-Cooperative	2	80	2
FS-Regular	7	271	4

Total number employed on blister rust control - 357

The first camp opened May 3, the last one June 18. Most of the camps were closed by September 1. One small crew continued until mid-October with stream type eradication.

Due to demands of the war industries suitable labor was difficult to secure. In addition, adverse weather conditions during the first part of the field season combined to make the labor situation even more acute. As a result, accomplishment was far behind normal schedule. These factors together with an increased wage scale and a considerable advance in food costs contributed to an increase in man-day costs.

LOCATION AND DESCRIPTION OF AREAS

The Forest Service camps were located as follows: Kalispell Creek, Jeru Creek, Hellroaring Creek, Sullivan Creek, Beaver Creek, Upper Priest River and the Priest River Experiment Station. The Bureau cooperative camps were located in Big Creek and Lost Creek.

Jeru Creek, Hellroaring Creek, Sullivan Creek and parts of Beaver Creek and Kalispell Creek represented difficult working conditions. Big Creek presented a seedling problem. Other areas could be considered light to medium with regard to working conditions.

METHODS AND EQUIPMENT

In general, standard methods were used. Close supervision was necessary and more straw bosses were used than has been the practice in the past. A portable kitchen mounted on a truck chassis was used for a mobile 10-man crew working on stream type eradication. The crew was thus easily and quickly moved from one point to another. A training program for developing competent crew leaders was worked out and showed considerable promise. An expansion of the idea is planned for next season.

CONTROL STATUS

On the Kaniksu operation a total of 464,397 acres have been covered by the eradication crews. Of this acreage 221,803 acres have been placed on a maintenance basis, 91,486 acres are considered in need of rework and 151,108 acres are up for post check.

Infection conditions are more severe in Soldier Creek, Tunnel Creek, North Fork of Big Creek and the South Fork of Granite Creek than any of the other areas.

CHECKING AND PINE DISEASE SURVEY

During the field season regular check was made on 10,353 acres at a cost of $0.198 per acre. In September and October Forest Service and Bureau personnel conducted a post check and pine disease survey on areas in the Priest Lake drainage. To carry on this work a camp was established at Navigation Ranger Station on Upper Priest Lake and later moved to Beaver Creek Ranger Station on the lower lake. Approximately 93 man-days were used in the field and in the compilation of data. A total of 43.7 miles of strip was run. The results of the survey are summarized as follows:

1. Plow Boy Mountain, T. 63 N., R. 4 W., secs. 19, 29, 30, 31, 32 (partial)

Acres in area (ribes eradication by ERA in 1936)	1,386
Miles of survey strip	8.7
Number trees examined	1,484
Number trees infected	14
Per cent trees infected	1.0
Number cankers found	16
Regular check 1936, ribes per acre - 7 bushes, 8 F.L.S.	
Post check 1942, ribes per acre - 11 bushes, 30 F.L.S.	

The 14 cankers found were about equally divided, occurring on 1936, 1937 and 1938 wood. Portions of this area should be reworked in 1943.

2. Trapper Creek, T. 63 N., R. 4 and 5 W., secs. 7, 12, 13, 18, 19 (partial)

Acres in area (ribes eradication in 1932)	1,360
Miles of survey strip	8.5
Number trees examined	1,687
Number trees infected	36
Per cent trees infected	2.1
Number cankers found	102
Post check in 1936, ribes per acre - 1 bush, 1 F.L.S.	
Post check in 1942, ribes per acre - 1 bush, 1 F.L.S.	

The post check in 1936 and the pine disease survey in 1942 indicate very few ribes on the upland portions of the area. By reworking the stream type along main Trapper Creek and its tributaries and approximately 150 acres of open reproduction in sections 5 and 6, most of the Trapper Creek drainage can be placed on maintenance.

3. Ruby Creek, T. 63 N., R. 5 W., secs. 1, 2, 12 (partial)

Acres in area (unworked)	15
Miles of survey strip	1.9
Number trees examined	603
Number trees infected	10
Per cent trees infected	1.7
Number cankers found	11
Post check 1942, ribes per acre - 10 bushes, 138 F.L.S.	

The disease survey was made along each side of the main creek. In spite of these numerous ribes the infection was light. The stand consists largely of white pine pole and some reproduction going into the pole stage. Due to the large number of ribes present and the fine stand of young white pine timber, a trail should be put into the drainage and the area worked in the near future.

4. Boulder Creek, T. 63 N., R. 5 W., secs. 21, 22, 23, 27, 28 (partial)

Acres in area (ribes eradication by ERA in 1936)	430
Miles of survey strip	1.9
Number trees examined	1,956
Number trees infected	18
Per cent trees infected	0.9
Number cankers found	26

Regular check 1936, ribes per acre - 0 bushes, 0 F.L.S.
Post check 1942, ribes per acre - 1 bush, 4 F.L.S.

In 1936 a large part of the area was eliminated as ribes-free. A small amount of stream type work should put this area on a maintenance basis.

5. Beaver Creek, T. 62 N., R. 4 W., secs. 1, 11, 12, 14, 18, 19 (partial)

Acres in area (ribes eradication by ERA in 1936)	1,137
Miles of survey strip	10.2
Number trees examined	1,967
Number trees infected	46
Per cent trees infected	2.3
Number cankers found	46

Regular check 1936, ribes per acre - 2 bushes, 4 F.L.S.
Post check 1942, ribes per acre - 4 bushes, 35 F.L.S.

The control area in the Beaver Creek drainage was largely burned over in 1925. White pine reproduction and the reproduction of ribes over most of the area have been heavy. Dead down timber and brush have made it a difficult area to work. Some initial work and rework in this drainage should be completed as soon as possible, preferably in 1943.

6. Caribou Creek, T. 63 N., R. 4 W., secs. 3, 26, 34, 35, 36 (partial)

Acres in area (ribes eradication by ERA in 1936, state cooperative crews 1938)	800
Miles of survey strip	7.2
Number trees examined	4,403
Number trees infected	147
Per cent trees infected	3.3
Number cankers found	192

Regular checks 1936 and 1938, ribes per acre - 1 bush, 1 F.L.S.
Post check 1942, ribes per acre - 6 bushes, 41 F.L.S.

Portions of this area should be given rework as soon as possible, preferably in 1943.

7. Bear Creek, T. 61 N., R. 4 W., secs. 2, 3, 11, 14 (partial)

Acres in area (ribes eradication by state cooperative crews in 1935)	720
Miles of survey strip	5.3
Number trees examined	4,165
Number trees infected	61
Per cent trees infected	1.5
Number cankers found	83

Regular check 1935, ribes per acre - 1 bush, 2 F.L.S.
Post check 1942, ribes per acre - 2 bushes, 8 F.L.S.

This area was largely burned over in 1925, and the reproduction of white pine since has been favorable. There are also some ribes in stream type that are not included in the 1942 survey.

This area should be worked in the near future after which much of it could be placed on maintenance.

CANKER ELIMINATION

The canker elimination work as described in last year's annual report was continued as far into the winter as weather conditions permitted. A total of 2,334 acres was covered, and 829,142 trees were treated with an expenditure of 2,049 man-days. Inspection of the work in 1942 indicated that there was little excessive "bleeding," and no apparent setback to the treated trees was visible. While some cankers were missed, it appeared that the work was successful in saving an adequate stocking of white pine on the areas treated.

STATEMENT OF EXPENDITURES AND COSTS

The statement of expenditures and costs is shown in the following tables by the cooperating agency and the type of appropriation:

TABLE 1

EXPENDITURES BY APPROPRIATIONS, CALENDAR YEAR 1942
KANIKSU OPERATION

Cooperating Agency	Appropriation	Amount
Bureau of Entomology and Plant Quarantine	Regular BLR-1-4	$ 7,590.61
	Regular BLR-3-4	9,463.52
	Subtotal	17,054.13
State of Idaho Priest Lake Timber Protective Association	State BLR-3-4	9,085.86
	Private BLR-3-4	4,240.44
	Subtotal	13,326.30
Forest Service	Regular BLR-4	92,570.31
Total		$122,950.74

TABLE 2

CLASSIFIED EXPENDITURES, CALENDAR YEAR 1942
KANIKSU OPERATION

Item	Bureau of Entomology and Plant Quarantine				Forest Service	
	Regular BLR-1-4	Regular BLR-3-4	State and Private BLR-3-4	Total	Regular BLR-4	Total
Sal. perm. men	$4,572.50			$ 4,572.50	$ 2,740.16	$ 7,312.66
Sal. temp. men	705.33	$2,002.64	$ 1,299.89	4,007.86	11,832.43	15,840.29
Wages, temp. labs.	235.04	3,639.90	11,948.37	15,823.31	54,551.84	70,375.15
Subs. supplies	871.13	3,378.85	78.04	4,328.02	17,764.21	22,092.23
Equipment	15.38			15.38	2,220.33	2,235.71
Trucks					579.39	579.39
Travel & transp.	397.65	251.04		648.69	1,065.64	1,714.33
Twine					884.68	884.68
Other supplies	793.58	191.09		984.67	931.63	1,916.30
Total	$7,590.61	$9,463.52	$13,326.30	$30,380.43	$92,570.31	$122,950.74

TABLE 2A

DISTRIBUTION OF EXPENDITURES BY PROJECTS, 1942
KANIKSU OPERATION

Project	Expenditures	Number Effective Man-Days	Effective Man-Day Cost
Planning, Coordination and Technical Direction			
BEPQ Regular BLR-1-4	$ 7,590.61		
Cooperative - State and Private Lands			
BEPQ Regular BLR-3-4	9,463.52		
State of Idaho BLR-3-4	9,085.86	2,702	$ 8.43
PLTPA BLR-3-4	4,240.44		
Total	22,789.82		
National Forest Lands			
Forest Service Regular BLR-4	92,570.31	6,711	$13.79

	Bureau	Forest Service
Number meals served	15,235	51,551
Average cost per meal	$0.239	$0.345
Pounds of twine	475	1,175

SUMMARY OF RIBES ERADICATION, 1942
KANIKSU OPERATION

TABLE 3 - SUMMARY OF ALL WORKINGS

Eradication Type	Acres First Working	Acres Second Working	Acres Third Working	Total Acres	Effective Man-Days	Total Ribes	Ribes Remaining Per Acre	
							Bushes	Live Stem
Cutover (Prior 1940)	181	2,206	89	2,476	2,053	563,479	19	32
Reproduction	1,708	1,797	725	4,230	3,518	669,464	5	17
Pole	1,475	2,012	454	3,941	3,199	407,725	4	8
Mature	116	347		463	154	33,635	6	9
Brush		92	115	207	76	2,312	1	3
Subalpine		60		60	12	12,019		
All Upland	3,480	6,514	1,383	11,377	9,012	1,688,634	8	14
Stream (Hand)	23	217	157	397	401	33,055	4	7
All Types	3,503	6,731	1,540	11,774	9,413	1,721,689	7	11

TABLE 3A - FIRST WORKING

Eradication Type	Acres	Effective Man-Days	Total Ribes	Per Acre Basis		Ribes Remaining Per Acre	
				Man-Days	Ribes	Bushes	Live Stem
Cutover (Prior 1940)	181	427	253,801	2.36	1,402	31	32
Reproduction	1,708	2,179	595,264	1.28	349	6	9
Pole	1,475	2,274	288,211	1.54	195	5	15
Mature	116	36	2,758	.31	24	9	20
All Upland	3,480	4,916	1,140,034	1.41	328	7	13
Stream (Hand)	23	48	2,975	2.09	129	1	1
All Types	3,503	4,964	1,143,009	1.42	326	6	12

TABLE 3B - SECOND WORKING

Cutover (Prior 1940)	2,206	1,602	305,214	.73	138	18	32
Reproduction	1,797	1,118	62,960	.62	35	4	9
Pole	2,012	748	99,679	.37	50	3	4
Mature	347	118	30,877	.34	89	5	5
Brush	92	13	544	.14	6		
Subalpine	60	12	12,019	.20	200		
All Upland	6,514	3,611	511,293	.55	78	8	15
Stream (Hand)	217	253	24,298	1.17	112	5	8
All Types	6,731	3,864	535,591	.57	80	8	14

TABLE 3C - THIRD WORKING

Cutover (Prior 1940)	89	24	4,464	.28	50	9	33
Reproduction	725	221	11,240	.30	16	10	25
Pole	454	177	19,835	.39	44	5	3
Brush	115	63	1,768	.55	15	1	5
All Upland	1,383	485	37,307	.35	27	6	13
Stream (Hand)	157	100	5,782	.64	37	10	29
All Types	1,540	585	43,089	.38	28	6	13

TABLE 4

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1942
KANIKSU OPERATION

State	Working	Class	Acres	Effective Man-Days	Total Ribes	Per Acre Basis		Ribes Remaining Per Acre	
						Man-Days	Ribes	Bushes	Live Stem
Idaho	First	EQ-Coop.	269	525	270,882	1.95	1,007	23	32
		FS-Reg.	1,847	2,114	187,370	1.14	101	5	15
		Total	2,116	2,639	458,252	1.25	217	7	17
	Second	EQ-Coop.	2,684	2,053	353,923	.76	132	16	30
		FS-Reg.	3,249	1,382	151,098	.43	47	1	3
		Total	5,933	3,435	505,021	.58	85	8	15
	Third	EQ-Coop.	253	124	11,624	.49	46	13	36
		FS-Reg.	1,287	461	31,465	.36	24	4	5
		Total	1,540	585	43,089	.38	28	7	10
	All Workings	EQ-Coop.	3,206	2,702	636,429	.84	199	17	30
		FS-Reg.	6,383	3,957	369,933	.62	58	3	7
		Total	9,589	6,659	1,006,362	.69	105	7	17
Washington	First	FS-Reg.	1,387	2,325	684,757	1.68	494	5	5
	Second	FS-Reg.	798	429	30,570	.54	39	4	7
	All Workings	FS-Reg.	2,185	2,754	715,327	1.26	327	5	6
Idaho and Washington	First	EQ-Coop.	269	525	270,882	1.95	1,007	23	32
		FS-Reg.	3,234	4,439	872,127	1.37	270	5	10
		Total	3,503	4,964	1,143,009	1.42	326	6	12
	Second	EQ-Coop.	2,684	2,053	353,923	.76	132	16	30
		FS-Reg.	4,047	1,811	181,668	.45	45	2	3
		Total	6,731	3,864	535,591	.57	80	8	14
	Third	EQ-Coop.	253	124	11,624	.49	46	13	36
		FS-Reg.	1,287	461	31,465	.36	24	4	5
		Total	1,540	585	43,089	.38	28	7	10
	All Workings	EQ-Coop.	3,206	2,702	636,429	.84	199	17	30
		FS-Reg.	8,568	6,711	1,085,260	.78	127	3	4
		Total	11,774	9,413	1,721,689	.80	146	8	14

TABLE 5

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1942
KANIKSU OPERATION

State	Working	Number of Acres Worked										
		By Forest Service			By Bureau of Entomology and Plant Quarantine			Total				
								Federal	Other			
		National Forest	Private	Total	State	Private	Total	National Forest	State	Private	Total	Total
Idaho	First	1,847		1,847	269		269	1,847	269		269	2,116
	Second	3,199	50	3,249	2,488	196	2,684	3,199	2,488	246	2,734	5,933
	Third	1,287		1,287	98	155	253	1,287	98	155	253	1,540
	Total	6,333	50	6,383	2,855	351	3,206	6,333	2,855	401	3,256	9,589
Washington	First	1,387		1,387				1,387				1,387
	Second	798		798				798				798
	Total	2,185		2,185				2,185				2,185
Total	First	3,234		3,234	269		269	3,234	269		269	3,503
	Second	3,997	50	4,047	2,488	196	2,684	3,997	2,488	246	2,734	6,731
	Third	1,287		1,287	98	155	253	1,287	98	155	253	1,540
	Total	8,518	50	8,568	2,855	351	3,206	8,518	2,855	401	3,256	11,774

TABLE 6

TOTAL RIBES BY SPECIES ERADICATED, 1942
KANIKSU OPERATION

Working	Eradication Type	Acres	Ribes by Species			Total Ribes
			Ribes lacustre	Ribes viscosissimum	Ribes inerme	
First	Cutover (Prior 1940)	181	40,581	213,220		253,801
	Reproduction	1,708	141,772	453,492		595,264
	Pole	1,475	132,195	156,016		288,211
	Mature	116	2,642	116		2,758
	All Upland	3,480	317,190	822,844		1,140,034
	Stream	23	1,508	1,467		2,975
	All Types	3,503	318,698	824,311		1,143,009
Second	Cutover (Prior 1940)	2,206	176,937	127,977	300	305,214
	Reproduction	1,797	26,019	35,739	1,202	62,960
	Pole	2,012	31,889	67,420	370	99,679
	Mature	347	15,756	15,121		30,877
	Brush	92	529	15		544
	Subalpine	60	8,124	3,895		12,019
	All Upland	6,514	259,254	250,167	1,872	511,293
	Stream	217	19,825	4,168	305	24,298
	All Types	6,731	279,079	254,335	2,177	535,591
Third	Cutover (Prior 1940)	89	1,456	3,008		4,464
	Reproduction	725	8,479	1,637	1,124	11,240
	Pole	454	6,235	13,475	125	19,835
	Brush	115	718	1,026	24	1,768
	All Upland	1,383	16,888	19,146	1,273	37,307
	Stream	157	4,107	1	1,674	5,782
	All Types	1,540	20,995	19,147	2,947	43,089
All Workings	Cutover (Prior 1940)	2,476	218,974	344,205	300	563,479
	Reproduction	4,230	176,270	490,868	2,326	669,464
	Pole	3,941	170,319	236,911	495	407,725
	Mature	463	18,398	15,237		33,635
	Brush	207	1,247	1,041	24	2,312
	Subalpine	60	8,124	3,895		12,019
	All Upland	11,377	593,332	1,092,157	3,145	1,688,634
	Stream	397	25,440	5,636	1,979	33,055
	All Types	11,774	618,772	1,097,793	5,124	1,721,689

SUMMARY OF RIBES ERADICATION 1923-1942
KANIKSU OPERATION

TABLE 7 - SUMMARY OF ALL WORKINGS

Eradication Type	Acres First Working	Acres Second Working	Acres Third Working	Total Acres	Effective Man-Days	Total Ribes
Cutover (Prior 1940)	8,364	4,614	140	13,118	11,227	3,184,091
Burn (Prior 1940)	1,132			1,132	1,354	947,874
Reproduction	163,752	33,748	6,638	204,138	149,727	37,075,018
Pole	121,779	16,456	475	138,710	49,762	6,639,773
Mature	141,657	5,463	105	147,225	33,058	6,108,597
Brush	3,599	688	179	4,466	1,586	367,519
Subalpine	1,933	110		2,043	1,044	169,129
Meadow-Field	71	10		81	1	72
All Upland	442,287	61,089	7,537	510,913	247,759	54,492,073
Stream (Hand)	20,604	5,198	523	26,325	45,807	9,251,497
Stream (Mechanical)	1,606			1,606	12,075	902,076
All Stream	22,210	5,198	523	27,931	57,882	10,153,573
All Types	464,497	66,287	8,060	538,844	305,641	64,645,646

TABLE 7A - FIRST WORKING

Eradication Type	Acres	Effective Man-Days	Total Ribes	Per Acre Basis	
				Man-Days	Ribes
Cutover (Prior 1940)	8,364	4,712	1,420,271	.56	170
Burn (Prior 1940)	1,132	1,354	947,874	1.20	837
Reproduction	163,752	113,242	31,519,188	.69	192
Pole	121,779	42,392	6,016,717	.35	49
Mature	141,657	30,191	5,773,779	.21	41
Brush	3,599	1,104	336,107	.31	93
Subalpine	1,933	1,019	156,522	.53	81
Meadow-Field	71				
All Upland	442,287	194,014	46,170,458	.44	104
Stream (Hand)	20,604	36,802	8,257,111	1.79	401
Stream (Mechanical)	1,606	12,075	902,076	7.52	562
All Stream	22,210	48,877	9,159,187	2.20	412
All Types	464,497	242,891	55,329,645	.52	119
TABLE 7B - SECOND WORKING					
Cutover (Prior 1940)	4,614	6,446	1,749,650	1.40	379
Reproduction	33,748	29,459	4,754,939	.87	141
Pole	16,456	7,184	603,127	.44	37
Mature	5,463	2,792	333,434	.51	61
Brush	688	360	28,386	.52	41
Subalpine	110	25	12,607	.23	115
Meadow-Field	10	1	72	.10	7
All Upland	61,089	46,267	7,482,215	.76	122
Stream (Hand)	5,198	8,434	959,554	1.62	185
All Types	66,287	54,701	8,441,769	.83	127
TABLE 7C - THIRD WORKING					
Cutover (Prior 1940)	140	69	14,170	.49	101
Reproduction	6,638	7,026	800,891	1.06	121
Pole	475	186	19,929	.39	42
Mature	105	75	1,384	.71	13
Brush	179	122	3,026	.68	17
All Upland	7,537	7,478	839,400	.99	111
Stream (Hand)	523	571	34,832	1.09	67
All Types	8,060	8,049	874,232	1.00	108

TABLE 8

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1923-1942
KANIKSU OPERATION

State	Working	Class	Acres	Effective Man-Days	Total Ribes	Per Acre Basis	
						Man-Days	Ribes
Idaho	First	EQ-Reg.	18,796	6,844	1,066,689	.36	57
		EQ-Coop.	111,419	31,454	9,021,754	.28	81
		EQ-Emerg.	80,596	48,602	8,318,777	.60	103
		FS-Reg.	12,992	19,581	2,992,203	1.51	230
		FS-Emerg.	87,988	34,005	8,313,023	.39	94
		CCC	54,536	37,126	6,588,494	.68	121
		Total	366,327	177,612	36,300,945	.48	99
	Second	EQ-Coop.	7,639	5,681	807,835	.74	106
		EQ-Emerg.	14,337	14,806	2,637,381	1.03	184
		FS-Reg.	10,355	4,728	674,505	.46	65
		FS-Emerg.	11,281	4,818	475,451	.43	42
		CCC	7,883	13,352	1,863,341	1.69	236
		Total	51,495	43,385	6,458,513	.84	125
	Third	EQ-Coop.	1,631	1,448	361,706	.89	222
		EQ-Emerg.	4,108	5,443	377,339	1.32	92
		FS-Reg.	1,496	590	49,409	.39	33
		Total	7,235	7,481	788,454	1.03	109
	All Workings	EQ-Reg.	18,796	6,844	1,066,689	.36	57
		EQ-Coop.	120,689	38,583	10,191,300	.32	84
		EQ-Emerg.	99,041	68,851	11,333,497	.70	114
		FS-Reg.	24,843	24,899	3,716,117	1.00	150
		FS-Emerg.	99,269	38,823	8,788,474	.39	89
		CCC	62,419	50,478	8,451,835	.81	135
		Total	425,057	228,478	43,547,912	.54	102
Washington	First	EQ-Emerg.	30,061	17,555	6,539,175	.58	218
		FS-Reg.	13,951	13,590	5,376,625	.97	385
		FS-Emerg.	34,417	12,708	3,858,496	.37	112
		CCC	19,741	21,426	3,254,404	1.09	165
		Total	98,170	65,279	19,028,700	.66	194
	Second	EQ-Emerg.	1,376	1,381	204,383	1.00	149
		FS-Reg.	8,880	4,978	1,391,280	.56	157
		FS-Emerg.	1,949	1,678	154,764	.86	79
		CCC	2,587	3,279	232,829	1.27	90
		Total	14,792	11,316	1,983,256	.77	134
	Third	EQ-Emerg.	192	352	10,513	1.83	55
		FS-Reg.	633	216	75,265	.34	119
		Total	825	568	85,778	.69	104
	All Workings	EQ-Emerg.	31,629	19,288	6,754,071	.61	214
		FS-Reg.	23,464	18,784	6,843,170	.80	292
		FS-Emerg.	36,366	14,386	4,013,260	.40	110
		CCC	22,328	24,705	3,487,233	1.11	156
		Total	113,787	77,163	21,097,734	.68	185
Idaho and Washington	First	EQ-Reg.	18,796	6,844	1,066,689	.36	57
		EQ-Coop.	111,419	31,454	9,021,759	.28	81
		EQ-Emerg.	110,657	66,157	14,857,952	.60	134
		FS-Reg.	26,945	33,171	8,368,828	1.23	311
		FS-Emerg.	122,405	46,713	12,171,519	.38	99
		CCC	74,277	58,552	9,842,898	.79	133
		Total	464,497	242,891	55,329,645	.52	119
	Second	EQ-Coop.	7,639	5,681	807,835	.74	106
		EQ-Emerg.	15,713	16,187	2,841,764	1.03	181
		FS-Reg.	19,235	9,706	2,065,785	.50	107
		FS-Emerg.	13,230	6,496	630,215	.49	48
		CCC	10,470	16,631	2,096,170	1.59	200
		Total	66,287	54,701	8,441,769	.83	127
	Third	EQ-Coop.	1,631	1,448	361,706	.89	222
		EQ-Emerg.	4,300	5,795	387,852	1.35	90
		FS-Reg.	2,129	806	124,674	.38	59
		Total	8,060	8,049	874,232	1.00	108
	All Workings	EQ-Reg.	18,796	6,844	1,066,689	.36	57
		EQ-Coop.	120,689	38,583	10,191,300	.32	84
		EQ-Emerg.	130,670	88,139	18,087,568	.67	138
		FS-Reg.	48,307	43,683	10,559,287	.90	219
		FS-Emerg.	135,635	53,209	12,801,734	.39	94
		CCC	84,747	75,183	11,939,068	.89	141
		Total	538,844	305,641	64,645,646	.57	120

TABLE 9

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1923-1942
KANIKSU OPERATION

State	Working	Number of Acres Worked						
		Federal			Other			Total
		National Forest	Public Domain	Total	State	Private	Total	
Idaho	First	186,826	54	186,880	111,185	68,262	179,447	366,327
	Second	27,460		27,460	15,449	8,586	24,035	51,495
	Third	1,391		1,391	4,876	968	5,844	7,235
	Total	215,677	54	215,731	131,510	77,816	209,326	425,057
Washington	First	69,440		69,440	2,080	26,650	28,730	98,170
	Second	13,748		13,748		1,044	1,044	14,792
	Third	633		633		192	192	825
	Total	83,821		83,821	2,080	27,886	29,966	113,787
Idaho and Washington	First	256,266	54	256,320	113,265	94,912	208,177	464,497
	Second	41,208		41,208	15,449	9,630	25,079	66,287
	Third	2,024		2,024	4,876	1,160	6,036	8,060
	Total	299,498	54	299,552	133,590	105,702	239,292	538,844

TABLE 10

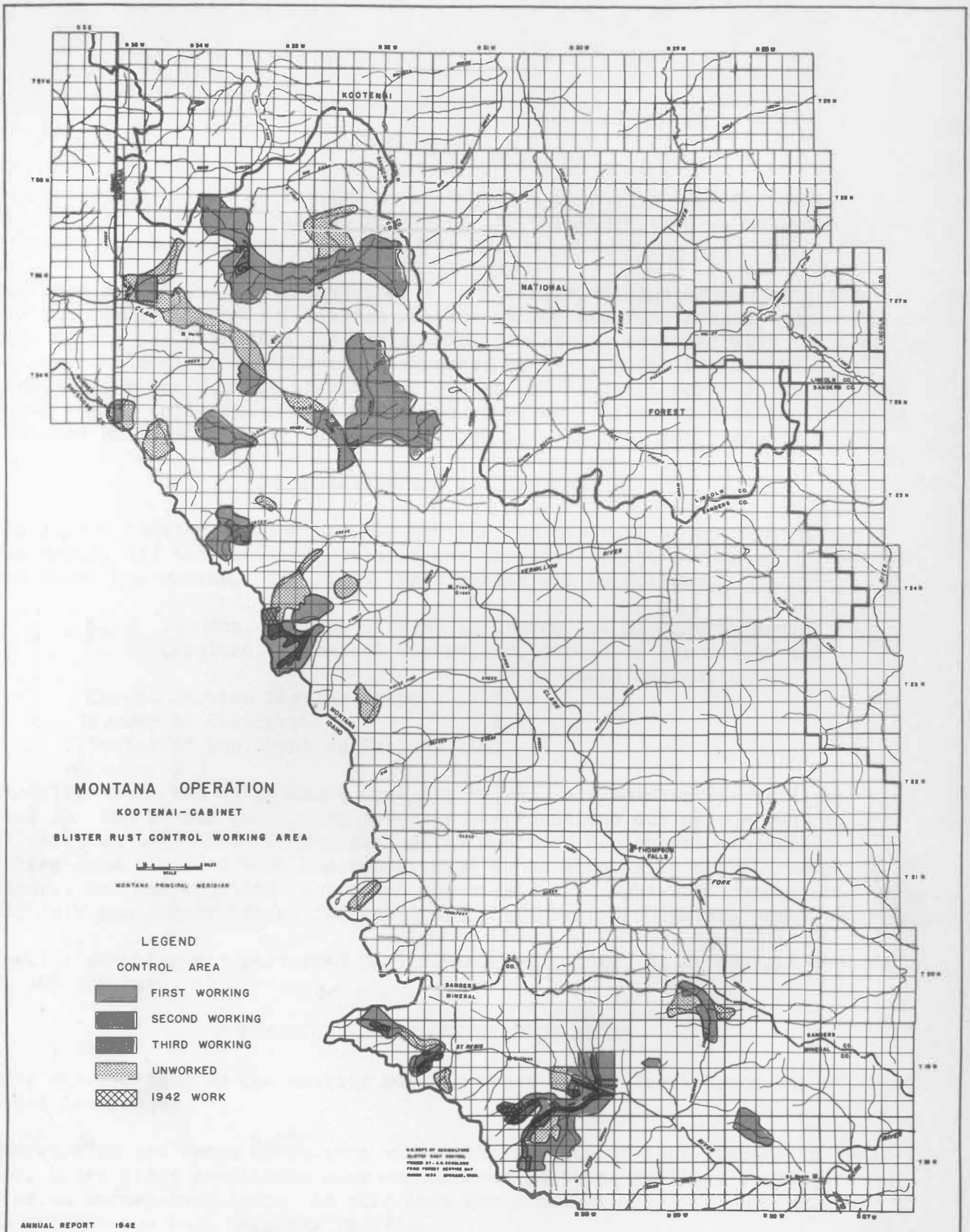
PROGRESS OF FIRST WORKING BY OWNERSHIP CLASSES, 1923-1942
KANIKSU OPERATION

State	Ownership Class	Number of Acres			Acres on Which Working is Deferred	Total Acres White Pine
		Worked	Unworked	Total		
Idaho	National Forest	186,826	41,857	228,683	26,202	254,885
	Public Domain	54	506	560		560
	Subtotal Federal	186,880	42,363	229,243	26,202	255,445
	State	111,185	17,255	128,440	30	128,470
	Private	68,262	44,058	112,320	5,390	117,710
	Subtotal Other	179,447	61,313	240,760	5,420	246,180
	Total	366,327	103,676	470,003	31,622	501,625
Washington	National Forest	69,440	29,870	99,310		99,310
	State	2,080	2,030	4,110		4,110
	Private	26,650	11,575	38,225		38,225
	Subtotal Other	28,730	13,605	42,335		42,335
	Total	98,170	43,475	141,645		141,645
Idaho and Washington	National Forest	256,266	71,727	327,993	26,202	354,195
	Public Domain	54	506	560		560
	Subtotal Federal	256,320	72,233	328,553	26,202	354,755
	State	113,265	19,285	132,550	30	132,580
	Private	94,912	55,633	150,545	5,390	155,935
	Subtotal Other	208,177	74,918	283,095	5,420	288,515
	Total	464,497	147,151	611,648	31,622	643,270

TABLE 11

TOTAL RIBES BY SPECIES ERADICATED, 1923-1942
KANIKSU OPERATION

Working	Eradication Type	Acres	Ribes by Species					Total Ribes
			Ribes lacustre	Ribes viscosissimum	Ribes inerme	Ribes irriguum	Ribes acerifolium	
First	Cutover (Prior 1940)	8,364	558,257	817,010	45,004			1,420,271
	Burn (Prior 1940)	1,132	153,516	790,402	3,956			947,874
	Reproduction	163,752	9,339,940	21,951,900	224,401	2,947		31,519,188
	Pole	121,779	2,883,306	2,899,348	208,435	21,714	3,914	6,016,717
	Mature	141,657	4,003,180	1,614,111	154,461		2,027	5,773,779
	Brush	3,599	68,387	203,158	64,562			336,107
	Subalpine	1,933	116,392	40,111	19			156,522
	Meadow-Field	71						
	All Upland	442,287	17,122,978	28,316,040	700,838	24,661	5,941	46,170,458
	Stream	22,210	4,859,148	425,512	3,854,943		19,584	9,159,187
	All Types	464,497	21,982,126	28,741,552	4,555,781	24,661	25,525	55,329,645
Second	Cutover (Prior 1940)	4,614	525,875	1,213,372	10,403			1,749,650
	Reproduction	33,748	1,352,725	3,372,686	29,528			4,754,939
	Pole	16,456	295,131	296,853	11,143			603,127
	Mature	5,463	168,978	160,587	3,874			333,434
	Brush	688	16,170	11,341	875			28,386
	Subalpine	110	8,585	4,022				12,607
	Meadow-Field	10	72					72
	All Upland	61,089	2,367,531	5,058,861	55,823			7,482,215
	Stream	5,198	504,471	50,656	404,427			959,554
	All Types	66,287	2,872,002	5,109,517	460,250			8,441,769
Third	Cutover (Prior 1940)	140	5,481	3,688	5,001			14,170
	Reproduction	6,638	216,298	582,185	2,408			800,891
	Pole	475	6,278	13,526	125			19,929
	Mature	105	713	671				1,384
	Brush	179	1,109	1,893	24			3,026
	All Upland	7,537	229,879	601,963	7,558			839,400
	Stream	523	28,914	4,045	1,873			34,832
	All Types	8,060	258,793	606,008	9,431			874,232
All Workings	Cutover (Prior 1940)	13,118	1,089,613	2,034,070	60,408			3,184,091
	Burn (Prior 1940)	1,132	153,516	790,402	3,956			947,874
	Reproduction	204,139	10,908,963	25,906,771	256,337	2,947		37,075,018
	Pole	138,710	3,184,715	3,209,727	219,703	21,714	3,914	6,639,773
	Mature	147,225	4,172,866	1,775,369	158,335		2,027	6,108,597
	Brush	4,466	85,666	216,392	65,461			367,519
	Subalpine	2,043	124,977	44,133	19			169,129
	Meadow-Field	81	72					72
	All Upland	510,913	19,720,388	33,976,864	764,219	24,661	5,941	54,492,073
	Stream	27,931	5,392,533	480,213	4,261,243		19,584	10,153,573
	All Types	538,844	25,112,921	34,457,077	5,025,462	24,661	25,525	64,645,646



ANNUAL REPORT 1942
A. S. SKOGLUND

BLISTER RUST CONTROL WORK, MONTANA OPERATION, 1942

By
A. S. Skoglund, Assistant Pathologist

INTRODUCTION

Blister rust control activities on the Montana operation were restricted to the Cabinet National Forest to alleviate the transportation situation and to simplify the supervision of the project.

The loss of CCC and WPA crews along with the difficulties in securing labor for the regular camps and adverse weather in May and June greatly reduced the size of the field program and the accomplishments as compared with the 1941 season. A total of 2,540 acres was worked in 1942, which brings the total progress for the Montana operation (Cabinet and Kootenai Forests) to 125,739 acres worked initially and 12,528 acres reworked. Ribes eradication has been deferred on 19,958 acres, and 55,043 acres need initial ribes eradication.

ORGANIZATION AND ADMINISTRATION

The Forest Service was responsible for the administration and maintenance of the camps, and technical supervision was provided by the Bureau of Entomology and Plant Quarantine. The field organization was as follows:

C. H. Johnson, Forest Officer in Charge, U. S. Forest Service
A. S. Skoglund, Technical Supervisor, Bureau of Entomology and Plant Quarantine

Forest Service Regular Camps	3
Number of Checkers	2
Number of Employees on Project	131

The first camp was established on April 28, and all were established by June 1. Two of the camps were moved to new locations during the summer, and all of them were discontinued during the month of September. Incessant rains during June retarded work and contributed to an abnormally high turnover of labor. One compensating factor was the relatively light fire conditions during July and August, which did not disrupt blister rust control work.

Regular checking was performed on 1,503 acres in 1942, at an average cost of $\$0.18\frac{1}{2}$ per acre.

LOCATION AND DESCRIPTION OF AREAS

Work was confined to the heavier working types in the Trout Creek and St. Regis River drainages.

The work in the Trout Creek area was a continuation of that started in 1941. Very heavy ribes conditions were encountered in this excellent reproduction type on burned-over land. As this area was not completed this season, it should receive high priority in 1943.

In Savenac Nursery an intensive check was made of the transplant and seedling stock in the spring of 1942. Eighty-three infected specimens were found in a check of 40,500 samples of 2-2 transplant stock sown in the fall of 1937 and transplanted in the spring of 1940. This represents .205 per cent infection. A survey of 32,000 specimens of two-year-old seedling stock sown in the fall of 1939 and germinated in the spring of 1940, disclosed 143 infected ones or .447 per cent infection. The pattern obtained by this survey revealed the infection to be of random distribution and possibly of long distance spread from the heavy masses of Ribes viscosissimum under Haugan Lookout. These ribes were removed in 1941 and 1942. The stream type in the Savenac Nursery protection zone was checked, and the scattered ribes removed.

The plantation areas in the West Fork of Big Creek were surveyed and the scattered concentrations of ribes removed. The stream type along the main creek was also worked. These ribes germinated for the most part from seed washed down the creek during the flood stages. This excellent stand of white pine reproduction has a scattering of infection. The reproduction in Gilt Edge Creek is infected very slightly and only near the stream. The reproduction in the main creek and four chains up the north-facing slope is 22 per cent infected, but the infection diminishes very rapidly beyond four chains. Ribes eradication performed in 1942 should prevent a further build-up of rust damage. A small amount of pruning of white pine has been done, and further pruning work in this area is recommended.

Rework was performed on the plantation areas of Rainy Creek. The conditions in Rainy Creek were reported in the 1941 annual report. In this area the white pine seed continue to germinate, and undoubtedly many of the diseased trees will be replaced by new seedlings.

First working and rework were done on the Sildex Plantation site. A small amount of Atlacide spraying was applied to R. triste in the main river. This area of pole size white pine contains about five per cent infection, although most cankers are near the ends of the rather long branches. The present infection does not appear to be damaging. Initial work took place in 1934 on about two thirds of the area. While the results of the ribes eradication work in 1942 on this area were not as efficient as expected, the necessity for any further control work will be determined by future surveys of the area.

CONTROL STATUS

In the Cabinet National Forest 74,421 acres have been initially worked. Of this area 38,345 acres have been placed on a maintenance basis, and 10,800 acres are on post check, leaving 25,076 acres on rework. There are also 23,380 acres to be initially worked.

The blister rust control area in the Cabinet National Forest may be divided into three parts on the basis of working and infection conditions, namely: St. Regis River, Clark Fork River and Bull River units. The St. Regis River unit, which includes Rainy and Big Creeks as well as Savenac Nursery, contains for the most part reproduction and planted stands on 1910 burned-over lands supporting heavy concentrations of ribes. Pine infection is relatively heavy and is of 1931 and 1934 origins with considerable build-up in 1937 to

1940. The masses of stream type ribes have been removed and Savenac Nursery and the West Fork of Big Creek are now in a satisfactory condition. About one half of the worked area in the East and Middle Forks of Big Creek will require some additional work.

The Clark Fork unit comprising seven drainages is predominantly reproduction and pole size white pine. Stream type conditions were relatively light which accounts for the small amount of infection. Trout Creek and Marten Creek have first working to be completed in 1943. Considerable acreage of pole size timber remains to be worked in this unit, but will be deferred until after more urgent needs are met in the Kootenai Forest.

The Bull River unit is composed of all types of stands associated with R. inerme stream type conditions. The infection is localized near streams which need to be reworked. Snake Creek has an area to be initially worked in the near future.

In the Kootenai National Forest 51,318 acres have been worked of which 28,163 acres are on maintenance, 13,663 acres are on post check, and 9,392 acres are to be reworked. There remain 31,663 acres to be initially worked in addition to 16,924 acres deferred.

The blister rust control area in the Kootenai National Forest may also be divided into three parts, namely: Yaak River, Libby, and Troy units. The Yaak River unit is predominantly pole and mature types with light ribes conditions. With very little infection having been found, it is planned to do no more work until the mature stands are logged. The amount of work required in the pole stands on Red Top and Cyclone Creeks will be determined by future disease surveys.

The Libby unit contains 70 per cent pole and mature types and 30 per cent reproduction. The ribes conditions are very light in the pole and mature stands and medium in the reproduction stands. Infection of 1937 and 1940 origin has been found in the reproduction stands in the southern end of the unit. Initial work should be started in this unit in the near future.

The Troy unit contains 52,039 acres of which 23,096 have been worked. The greatest amount of infection in the forest was found in this unit with the first being located in 1935. A very heavy center is located in Ross Creek just south of the lake. A small amount of infection of 1940 origin was found at Spar Lake. The area immediately west and north of Spar Lake should be worked in 1943. Extensive logging has been done in this unit in the last two years, consequently much of the area needs to be re-examined to determine limits and amounts of area to be classified as white pine.

STATEMENT OF EXPENDITURES AND COSTS

The statement of expenditures and costs by cooperative agency and type of appropriation is shown in the following tabulations:

TABLE 1

EXPENDITURES BY APPROPRIATIONS, CALENDAR YEAR 1942
MONTANA OPERATION

Cooperating Agency	Appropriation	Amount
Bureau of Entomology and Plant Quarantine	Regular BLR-1-4	$ 3,081.47
Forest Service	Regular BLR-4	39,740.29
Total		$42,821.76

TABLE 2

CLASSIFIED EXPENDITURES, CALENDAR YEAR 1942
MONTANA OPERATION

Item	Bureau of Entomology and Plant Quarantine Regular BLR-1-4	Forest Service Regular BLR-4	Total
Sal., perm. men	$2,824.80	$ 3,195.72	$ 6,020.52
Sal., temp. men		2,528.99	2,528.99
Wages, temp. labs.		25,996.56	25,996.56
Subs. supplies		6,369.11	6,369.11
Equipment		1,018.90	1,018.90
Travel and transp.	228.86	418.55	647.41
Other supplies	27.81	212.46	240.27
Total	$3,081.47	$39,740.29	$42,821.76

TABLE 2A

DISTRIBUTION OF EXPENDITURES BY PROJECTS, 1942
MONTANA OPERATION

Project	Expenditures	Number Effective Man-Days	Effective Man-Day Cost
Planning, Coordination and Technical Direction BEPQ Regular BLR-1-4	$ 3,081.47		
National Forest Lands Forest Service Regular BLR-4	$39,740.29	3,755	$10.58

	Forest Service
Number meals served	23,133
Average cost per meal	$0.275
Pounds of twine	650
Pounds of chemical	600

SUMMARY OF RIBES ERADICATION, 1942
MONTANA OPERATION

TABLE 3 - SUMMARY OF ALL WORKINGS

Forest	Eradication Type	Acres First Working	Acres Second Working	Acres Third Working	Total Acres	Effective Man-Days	Total Ribes	Gallons Spray	Ribes Remaining Per Acre	
									Bushes	Live Stem
Cabinet	Reproduction	368	644	309	1,321	1,940	218,345		14.0	42.1
	Pole	52	192		244	592	100,873		16.6	41.0
	All Upland	420	836	309	1,565	2,532	319,218		14.7	41.9
	Stream (Hand)		83	279	362	459	46,749			
	Stream (Chemical)		5		5	10	1,800	600		
	All Stream		83	279	362	469	48,549		5.9	15.3
	All Types	420	919	588	1,927	3,001	367,767		14.4	40.9
Savenac Nursery	Reproduction	92	15	60	167	682	158,777		17.1	27.2
	Stream (Hand)		22	424	446	72	5,595		1.0	1.2
	All Types	92	37	484	613	754	164,372		10.0	15.8
All Forests	Reproduction	460	659	369	1,488	2,622	377,122		14.7	39.0
	Pole	52	192		244	592	100,873		16.6	41.0
	All Upland	512	851	369	1,732	3,214	477,995		15.1	39.4
	Stream (Hand)		105	703	808	531	52,344			
	Stream (Chemical)		5		5	10	1,800			
	All Stream		105	703	808	541	54,144		2.0	3.9
	All Types	512	956	1,072	2,540	3,755	532,139		13.3	34.6

TABLE 3A - FIRST WORKING

Forest	Eradication Type	Acres	Effective Man-Days	Total Ribes	Gallons Spray	Per Acre Basis			Ribes Remaining Per Acre	
						Man-Days	Ribes	Gallons Spray	Bushes	Live Stem
Cabinet	Reproduction	368	1,061	131,173		2.88	356		54.0	164.0
	Pole	52	236	47,400		4.54	912		42.1	101.8
	All Types	420	1,297	178,573		3.09	425		50.0	143.0
Savenac Nursery	Reproduction	92	642	155,640		6.98	1,692		22.7	34.3
All Forests	Reproduction	460	1,703	286,813		3.70	624		37.5	95.8
	Pole	52	236	47,400		4.54	912		42.1	101.8
	All Types	512	1,939	334,213		3.79	653		38.8	98.1
TABLE 3B - SECOND WORKING										
Cabinet	Reproduction	644	580	68,430		.90	106		8.0	24.6
	Pole	192	356	53,473		1.85	279		10.1	25.3
	All Upland	836	936	121,903		1.12	146		8.5	24.8
	Stream (Hand)	83	173	14,102		2.08	170			
	Stream (Chemical)	5	10	1,800	600	2.00	360	120		
	All Stream	83	183	15,902		2.20	192		5.9	15.3
	All Types	919	1,119	137,805		1.22	150		8.4	24.4
Savenac Nursery	Reproduction	15	5	137		.33	9		0	0
	Stream	22	9	353		.41	16			
	All Types	37	14	490		.38	13		0	0
All Forests	Reproduction	659	585	68,567		.89	104		7.9	24.1
	Pole	192	356	53,473		1.85	279		10.1	25.3
	All Upland	851	941	122,040		1.11	143		8.4	24.4
	Stream (Hand)	105	182	14,455		1.73	138			
	Stream (Chemical)	5	10	1,800	600	2.00	360	120		
	All Stream	105	192	16,255		1.83	155		5.9	15.3
	All Types	956	1,133	138,295		1.19	145		8.3	24.0
TABLE 3C - THIRD WORKING										
Cabinet	Reproduction	309	299	18,742		.97	61		6.5	14.0
	Stream (Hand)	279	286	32,647		1.03	117			
	All Types	588	585	51,389		.99	87		6.5	14.0
Savenac Nursery	Reproduction	60	35	3,000		.58	50		11.1	20.5
	Stream (Hand)	424	63	5,242		.15	12		1.0	1.2
	All Types	484	98	8,242		.20	17		4.2	7.4
All Forests	Reproduction	369	334	21,742		.91	59		8.5	16.8
	Stream (Hand)	703	349	37,889		.50	54		1.0	1.2
	All Types	1,072	683	59,631		.64	56		4.9	9.4

TABLE 4

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1942
MONTANA OPERATION

Forest	Working	Number of Acres Worked by Forest Service		
		National Forest	Private	Total
Cabinet	First	420		420
	Second	846	73	919
	Third	475	113	588
	Total	1,741	186	1,927
Savenac Nursery	First	92		92
	Second	34	3	37
	Third	181	303	484
	Total	307	306	613
All Forests	First	512		512
	Second	880	76	956
	Third	656	416	1,072
	Total	2,048	492	2,540

TABLE 5

TOTAL RIBES BY SPECIES ERADICATED, 1942
MONTANA OPERATION

Working	Eradication Type	Acres	Ribes by Species					Total Ribes
			Ribes lacustre	Ribes viscosissimum	Ribes petiolare	Ribes inerme	Ribes triste	
First	Reproduction	460	54,179	232,634				286,813
	Pole	52	47,400					47,400
	All Types	512	101,579	232,634				334,213
Second	Reproduction	659	61,717	6,850				68,567
	Pole	192	53,354		119			53,473
	All Upland	851	115,071	6,850	119			122,040
	Stream	105	8,342	163	6,480		1,270	16,255
	All Types	956	123,413	7,013	6,599		1,270	138,295
Third	Reproduction	369	15,092	6,443	93		114	21,742
	Stream	703	9,965	319	18,331	622	8,652	37,889
	All Types	1,072	25,057	6,762	18,424	622	8,766	59,631
All Workings	Reproduction	1,488	130,988	245,927	93		114	377,122
	Pole	244	100,754		119			100,873
	All Upland	1,732	231,742	245,927	212		114	477,995
	Stream	808	18,307	482	24,811	622	9,922	54,144
	All Types	2,540	250,049	246,409	25,023	622	10,036	532,139

SUMMARY OF RIBES ERADICATION, 1928-1942
MONTANA OPERATION

TABLE 6 - SUMMARY OF ALL WORKINGS

Forest	Eradication Type	Acres First Working	Acres Second Working	Acres Third Working	Total Acres	Effective Man-Days	Total Ribes	Gallons Spray
Kootenai	Burn (Prior 1940)	115			115	1	32	
	Reproduction	12,504	341		12,845	8,783	1,101,839	
	Pole	18,884	779		19,663	7,830	851,971	
	Mature	16,427			16,427	3,539	481,919	
	Brush	235			235	94	7,956	
	Meadow-Field	103			103	1		
	All Upland	48,268	1,120		49,388	20,248	2,443,717	
	Stream (Hand)	3,050	533		3,583	8,982	1,277,034	
	All Types	51,318	1,653		52,971	29,230	3,720,751	
Cabinet	Reproduction	27,758	4,670	703	33,131	33,526	6,048,216	
	Pole	23,634	783	50	24,467	9,997	1,837,428	
	Mature	9,297	12		9,309	4,462	1,065,784	
	Brush	3,481			3,481	2,044	583,683	
	Meadow-Field	348			348	150	12,131	
	All Upland	64,518	5,465	753	70,736	50,179	9,547,242	
	Stream (Hand)	3,717	1,003	351	5,071	12,893	3,017,509	
	Stream (Chemical	465	116	12	593	1,604	108,762	36,254
	Stream (Mechanical)	98			98	859	51,000	
	All Stream	3,815	1,003	351	5,169	15,352	3,177,271	
	All Types	68,333	6,468	1,104	75,905	65,541	12,724,513	
Savenac Nursery	Reproduction	5,000	179	85	5,264	1,944	559,902	
	Stream (Hand)	1,088	984	2,040	4,112	4,249	730,520	
	Stream (Chemical)	239	62		301	880	200,801	36,262
	Stream (Mechanical)	45	15	40	100	846	45,500	
	All Stream	1,088	999	2,040	4,127	5,975	976,821	
	All Types	6,088	1,178	2,125	9,391	7,919	1,536,723	
All Forests	Burn (Prior 1940)	115			115	1	32	
	Reproduction	45,262	5,190	788	51,240	44,253	7,709,957	
	Pole	42,518	1,562	50	44,130	17,827	2,689,399	
	Mature	25,724	12		25,736	8,001	1,547,703	
	Brush	3,716			3,716	2,138	591,639	
	Meadow-Field	451			451	151	12,131	
	All Upland	117,786	6,764	838	125,388	72,371	12,550,861	
	Stream (Hand)	7,855	2,520	2,391	12,766	26,130	5,025,063	
	Stream (Chemical)	704	178	12	894	2,484	309,563	72,516
	Stream (Mechanical)	143	15	40	198	1,705	96,500	
	All Stream	7,953	2,535	2,391	12,879	30,319	5,431,126	
	All Types	125,739	9,299	3,229	138,267	102,690	17,981,987	

TABLE 6A - FIRST WORKING

Forest	Eradication Type	Acres	Effective Man-Days	Total Ribes	Gallons Spray	Per Acre Basis		
						Man-Days	Ribes	Gallons Spray
Kootenai	Burn (Prior 1940)	115	1	32		.01	1	
	Reproduction	12,504	9,618	1,076,317		.69	86	
	Pole	18,884	7,223	811,481		.38	43	
	Mature	16,427	3,539	481,919		.22	29	
	Brush	235	94	7,956		.40	34	
	Meadow-Field	103	1			.01		
	All Upland	48,268	19,476	2,377,705		.40	49	
	Stream (Hand)	3,050	8,177	1,214,159		2.68	398	
	All Types	51,318	27,653	3,591,864		.54	70	
Cabinet	Reproduction	27,758	26,677	5,300,251		.96	191	
	Pole	23,634	9,148	1,742,087		.39	74	
	Mature	9,297	4,447	1,064,328		.48	114	
	Brush	3,481	2,044	583,683		.59	168	
	Meadow-Field	348	150	12,131		.43	35	
	All Upland	64,518	42,466	8,702,480		.66	135	
	Stream (Hand)	3,717	10,729	2,828,039		2.89	761	
	Stream (Chemical)	465	1,180	77,079	25,693	2.54	166	55
	Stream (Mechanical)	98	859	51,000		8.77	520	
	All Stream	3,815	12,768	2,956,118		3.35	775	
	All Types	68,333	55,234	11,658,598		.81	171	
Savenac Nursery	Reproduction	5,000	1,688	521,650		.34	104	
	Stream (Hand)	1,088	1,710	372,268		1.57	342	
	Stream (Chemical)	239	777	188,401	32,132	3.25	788	134
	Stream (Mechanical)	45	168	22,500		3.73	500	
	All Stream	1,088	2,655	583,169		2.44	536	
	All Types	6,088	4,343	1,104,819		.71	181	
All Forests	Burn (Prior 1940)	115	1	32		.01	1	
	Reproduction	45,262	36,983	6,898,218		.82	152	
	Pole	42,518	16,371	2,553,568		.39	60	
	Mature	25,724	7,986	1,546,247		.31	60	
	Brush	3,716	2,138	591,639		.58	159	
	Meadow-Field	451	151	12,131		.33	27	
	All Upland	117,786	63,630	11,601,835		.54	98	
	Stream (Hand)	7,855	20,616	4,414,466		2.62	562	
	Stream (Chemical)	704	1,957	265,480	57,825	2.78	377	82
	Stream (Mechanical)	143	1,027	73,500		7.18	514	
	All Stream	7,953	23,600	4,753,446		2.97	598	
	All Types	125,739	87,230	16,355,281		.69	130	

TABLE 6B - SECOND WORKING

Kootenai	Reproduction	341	165	25,522		.48	75	
	Pole	779	607	40,490		.78	52	
	All Upland	1,120	772	66,012		.69	59	
	Stream (Hand)	533	805	62,875		1.51	118	
	All Types	1,653	1,577	128,887		.95	78	
Cabinet	Reproduction	4,670	6,080	675,094		1.30	145	
	Pole	783	750	89,475		.96	114	
	Mature	12	15	1,456		1.25	121	
	All Upland	5,465	6,845	766,025		1.25	140	
	Stream (Hand)	1,003	1,844	151,609		1.84	151	
	Stream (Chemical)	116	276	21,048	7,016	2.38	181	60
	All Stream	1,003	2,120	172,657		2.11	172	
	All Types	6,468	8,965	938,682		1.39	145	
Savenac Nursery	Reproduction	179	186	34,173		1.04	191	
	Stream (Hand)	984	1,018	294,673		1.03	299	
	Stream (Chemical	62	103	12,400	4,130	1.66	200	67
	Stream (Mechanical)	15	36	3,000		2.40	200	
	All Stream	999	1,157	310,073		1.16	310	
	All Types	1,178	1,343	344,246		1.14	292	
All Forests	Reproduction	5,190	6,431	734,789		1.24	142	
	Pole	1,562	1,357	129,965		.87	83	
	Mature	12	15	1,456		1.25	121	
	All Upland	6,764	7,803	866,210		1.15	128	
	Stream (Hand)	2,520	3,667	509,157		1.46	202	
	Stream (Chemical)	178	379	33,448	11,146	2.13	188	63
	Stream (Mechanical)	15	36	3,000		2.40	200	
	All Stream	2,535	4,082	545,605		1.61	215	
	All Types	9,299	11,885	1,411,815		1.28	152	

TABLE 6C - THIRD WORKING

Cabinet	Reproduction	703	769	72,871		1.09	104	
	Pole	50	99	5,866		1.98	117	
	All Upland	753	868	78,737		1.15	105	
	Stream (Hand)	351	326	37,861		.93	108	
	Stream (Chemical)	12	148	10,635	3,545	12.33	886	295
	All Stream	351	474	48,496		1.35	138	
	All Types	1,104	1,342	127,233		1.22	115	
Savenac Nursery	Reproduction	85	70	4,079		.82	48	
	Stream (Hand)	2,040	1,521	63,579		.75	31	
	Stream (Mechanical)	40	642	20,000		16.05	500	
	All Stream	2,040	2,163	83,579		1.06	41	
	All Types	2,125	2,233	87,658		1.05	41	
All Forests	Reproduction	788	839	76,950		1.06	98	
	Pole	50	99	5,866		1.98	117	
	All Upland	838	938	82,816		1.12	99	
	Stream (Hand)	2,391	1,847	101,440		.77	42	
	Stream (Chemical)	12	148	10,635	3,545	12.33	886	295
	Stream (Mechanical)	40	642	20,000		16.05	500	
	All Stream	2,391	2,637	132,075		1.10	55	
	All Types	3,229	3,575	214,891		1.11	67	

TABLE 7

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1928-1942
MONTANA OPERATION

Working	Class	Acres	Effective Man-Days	Total Ribes	Gallons Spray	Per Acre Basis		
						Man-Days	Ribes	Gallons Per Sprayed Area
First	EQ-Reg.	1,383	2,315	462,300	30,665	1.67	334	148
	EQ-Emerg.	64,086	28,413	5,450,738	1,330	.44	85	44
	FS-Reg.	13,036	13,331	1,987,742	2,452	1.02	152	54
	FS-Emerg.	33,462	33,088	7,157,633	20,598	.99	214	55
	CCC	13,772	10,083	1,296,868	2,780	.73	94	59
	Total	125,739	87,230	16,355,281	57,825	.69	130	82
Second	EQ-Reg.	619	980	299,410	4,130	1.58	484	67
	EQ-Emerg.	1,342	1,597	265,637		1.19	198	
	FS-Reg.	4,560	4,670	479,320	5,976	1.02	105	62
	FS-Emerg.	2,100	2,464	204,021	1,040	1.17	97	52
	CCC	678	2,174	163,427		3.21	241	
	Total	9,299	11,885	1,411,815	11,146	1.28	152	63
Third	EQ-Emerg.	648	777	59,040		1.20	91	
	FS-Reg.	2,406	2,547	138,068		1.06	57	
	FS-Emerg.	150	68	6,069		.45	40	
	CCC	25	183	11,714	3,545	7.32	469	295
	Total	3,229	3,575	214,891	3,545	1.11	67	295
All Workings	EQ-Reg.	2,002	3,295	761,710	34,795	1.65	380	129
	EQ-Emerg.	66,076	30,787	5,775,415	1,330	.47	87	44
	FS-Reg.	20,002	20,548	2,605,130	8,428	1.03	130	60
	FS-Emerg.	35,712	35,620	7,367,723	21,638	1.00	206	55
	CCC	14,475	12,440	1,472,009	6,325	.86	102	107
	Total	138,267	102,690	17,981,987	72,516	.74	130	81

TABLE 8

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1928-1942
MONTANA OPERATION

Forest	Working	Number of Acres Worked						
		Federal			Other			Total
		National Forest	Public Domain	Total	State	Private	Total	
Kootenai	First	46,781		46,781		4,537	4,537	51,318
	Second	1,165		1,165		488	488	1,653
	Total	47,946		47,946		5,025	5,025	52,971
Cabinet	First	57,485	40	57,525	576	16,320	16,896	74,421
	Second	6,091		6,091		1,555	1,555	7,646
	Third	1,553		1,553		1,676	1,676	3,229
	Total	65,129	40	65,169	576	19,551	20,127	85,296
All Forests	First	104,266	40	104,306	576	20,857	21,433	125,739
	Second	7,256		7,256		2,043	2,043	9,299
	Third	1,553		1,553		1,676	1,676	3,229
	Total	113,075	40	113,115	576	24,576	25,152	138,267

TABLE 9

PROGRESS OF FIRST WORKING BY OWNERSHIP CLASSES, 1928-1942
MONTANA OPERATION

Forest	Ownership Class	Number of Acres			Acres on Which Working is Deferred	Total Acres White Pine
		Worked	Unworked	Total		
Kootenai	National Forest	46,781	25,680	72,461	14,434	86,895
	State		234	234		234
	Private	4,537	5,749	10,286	2,490	12,776
	Subtotal Other	4,537	5,983	10,520	2,490	13,010
	Total	51,318	31,663	82,981	16,924	99,905
Cabinet	National Forest	57,485	16,469	73,954	3,034	76,988
	Public Domain	40		40		40
	Subtotal Federal	57,525	16,469	73,994	3,034	77,028
	State	576		576		576
	Private	16,320	6,911	23,231		23,231
	Subtotal Other	16,896	6,911	23,807		23,807
	Total	74,421	23,380	97,801	3,034	100,835
All Forests	National Forest	104,266	42,149	146,415	17,468	163,883
	Public Domain	40		40		40
	Subtotal Federal	104,306	42,149	146,455	17,468	163,923
	State	576	234	810		810
	Private	20,857	12,660	33,517	2,490	36,007
	Subtotal Other	21,433	12,894	34,327	2,490	36,817
	Total	125,739	55,043	180,782	19,958	200,740

TABLE 10

TOTAL RIBES BY SPECIES ERADICATED, 1928-1942
MONTANA OPERATION

Working	Eradication Type	Acres	Ribes by Species							Total Ribes
			Ribes lacustre	Ribes viscosissimum	Ribes petiolare	Ribes inerme	Ribes irriguum	Ribes coloradense	Ribes triste	
First	Burn (Prior 1940)	115	32							32
	Reproduction	45,262	3,149,308	3,569,225	4,714	55,569	114,802	3,455	1,145	6,898,218
	Pole	42,518	1,425,435	942,390	200	101,205	84,338			2,553,568
	Mature	25,724	1,341,526	177,396	259	11,080	8,729	7,257		1,546,247
	Brush	3,716	286,409	294,808		5,260	5,162			591,639
	Meadow-Field	451	5,010			7,121				12,131
	All Upland	117,786	6,207,720	4,983,819	5,173	180,235	213,031	10,712	1,145	11,601,835
	Stream	7,953	3,026,316	118,098	266,006	1,284,254	5,744	31,905	21,123	4,753,446
	All Types	125,739	9,234,036	5,101,917	271,179	1,464,489	218,775	42,617	22,268	16,355,281
Second	Reproduction	5,190	429,241	282,763	4,860	4,668	10,666		2,591	734,789
	Pole	1,562	98,222	24,284	119	6,419	921			129,965
	Mature	12	1,456							1,456
	All Upland	6,764	528,919	307,047	4,979	11,087	11,587		2,591	866,210
	Stream	2,535	151,219	3,286	48,208	324,083	10,975		7,834	545,605
	All Types	9,299	680,138	310,333	53,187	335,170	22,562		10,425	1,411,815
Third	Reproduction	788	45,864	30,679	93		200		114	76,950
	Pole	50	800	5,060			6			5,866
	All Upland	838	46,664	35,739	93		206		114	82,816
	Stream	2,391	17,832	339	35,905	62,257			15,742	132,075
	All Types	3,229	64,496	36,078	35,998	62,257	206		15,856	214,891
All Workings	Burn (Prior 1940)	115	32							32
	Reproduction	51,240	3,624,413	3,882,667	9,667	60,237	125,668	3,455	3,850	7,709,957
	Pole	44,130	1,524,457	971,734	319	107,624	85,265			2,689,399
	Mature	25,736	1,342,982	177,396	259	11,080	8,729	7,257		1,547,703
	Brush	3,716	286,409	294,808		5,260	5,162			591,639
	Meadow-Field	451	5,010			7,121				12,131
	All Upland	125,388	6,783,303	5,326,605	10,245	191,322	224,824	10,712	3,850	12,550,861
	Stream	12,879	3,195,367	121,723	350,119	1,670,594	16,719	31,905	44,699	5,431,126
	All Types	138,267	9,978,670	5,448,328	360,364	1,861,916	241,543	42,617	48,549	17,981,987

WHITE PINE BLISTER RUST CONTROL ON NATIONAL AND STATE PARKS, 1942

By
M. C. Riley
Associate Forester

White pine blister rust control work in National and State Parks was confined to Mount Rainier and Glacier National Parks. No work was done on or adjacent to the Mount Spokane State Park area since there is no appreciable amount of Federal or Timber Protective Association lands and almost constant change of ownership precludes the possibility of any cooperative program at the present time. Progress of ribes eradication to date for this area is shown in the 1941 annual report for the Mount Spokane operation.

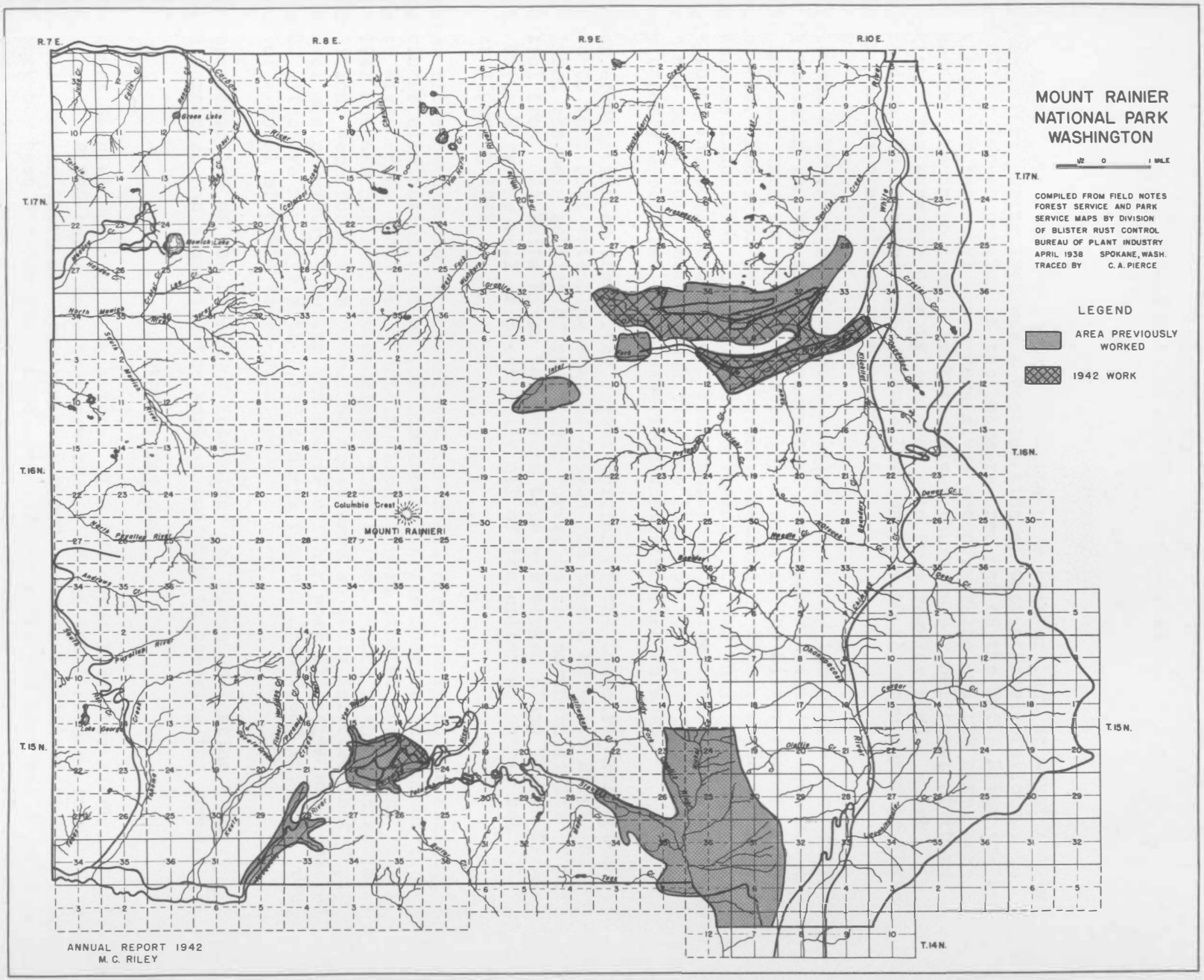
During the course of the season a small amount of time was spent on the Mount Spokane area in performing post check and in examining areas where canker elimination and pruning had been done. The results of canker elimination and pruning appeared to be entirely successful in saving infected trees and preserving adequate stocking of white pine reproduction. While the pruning of trees was held to the lower one third of the crown except where infection occurred in branches above this, the inspection this year indicated that at least one and generally two additional whorls of branches could have been cut off without hurting the young white pine. It was observed that pruning did not cause adventitious budding where limbs were cut off, even in cases where there were many such buds before pruning.

Control status figures for the Mount Spokane operation show that 23,377 acres have been given first working and 11,583 acres are unworked for a total of 34,960 acres in the control area. In the 23,377 acres which have been worked, 10,409 are on a maintenance basis, 4,740 need post check and 8,228 acres need reworking.

A complete report for each National Park is given on the following pages, while a short summary of the ribes eradication work accomplished thus far in each park is given below:

PROGRESS OF RIBES ERADICATION, MOUNT RAINIER AND GLACIER NATIONAL PARKS

National Park	Working	Acres	Effective Man-Days	Total Ribes	Per Acre	
					Man-Days	Ribes
Mount Rainier	First	8,254	10,070	1,640,507	1.22	199
	Second	5,028	5,941	400,913	1.18	80
	Third	3,944	2,909	94,224	.74	24
	Total	17,226	18,920	2,135,644	1.10	124
Glacier	First	2,895	3,134	360,996	1.08	125
	Second	731	763	122,606	1.04	168
	Total	3,626	3,897	483,602	1.07	133
Mount Rainier and Glacier	First	11,149	13,204	2,001,503	1.18	180
	Second	5,759	6,704	523,519	1.16	91
	Third	3,944	2,909	94,224	.74	24
	Total	20,852	22,817	2,619,246	1.09	126



ANNUAL REPORT 1942
M. C. RILEY

BLISTER RUST CONTROL
MOUNT RAINIER NATIONAL PARK, 1942

By
M. C. Riley
Associate Forester

Ribes eradication for the control of white pine blister rust on Mount Rainier National Park during 1942 was a continuation of that started previously on the Silver Forest portion of the Longmire area and on the White River area. In the Silver Forest 71 acres were given second working and 112 acres were worked for the third time. At White River there were 2,021 acres of third working. The work was done by one camp paid from regular funds, which started on the Longmire area on June 11. On July 20 the crew moved to White River and the camp closed on September 5.

Inclement weather with unfavorable working conditions interfered materially with training and the orderly progress of the program while the crew was on the Longmire area so that all contemplated work in the Silver Forest was not completed. The labor problem was acute. Because of higher wages being paid in defense industries in the immediate vicinity it was only possible to secure young inexperienced labor. There was an excessive labor turnover during June and early July because much time was lost due to rain. The work was very capably supervised by an experienced blister rust foreman.

Ribes eradication on the Silver Forest portion of the Longmire area was confined to that part extending east of Canyon rim toward Paradise River and included the main section of the Silver Forest to the northern limits of the control area. At White River the stream type was worked along Yakima Creek and White River as well as practically all of the upland which was not covered during 1941.

After ribes eradication was completed the small crew remaining was assigned to canker elimination east of the Blockhouse in the Sunrise portion of the White River area. This was a continuation of work started during the fall of 1941 but was not entirely completed this season. Much lighter infection conditions were found this year. No trees were so badly infected that their removal was necessary. During the course of this work 315 acres were covered in 93 effective man-days with 7,798 cankers removed from 3,669 infected trees out of a total of 5,824 trees examined.

A representative of the Bureau of Entomology and Plant Quarantine helped plan, organize and supervise the work in addition to checking the areas.

RECOMMENDATIONS

On Mount Rainier National Park a total of 8,254 acres have been given initial working and 8,972 acres have been reworked. Of the total acreage involved in initial working there are approximately 5,500 acres on a maintenance basis. No work has been done on the Starbo area for ten years and none was done in Stevens Canyon during 1942 and no appreciable amount in 1941. Until a decision is made by the National Park Service to continue ribes eradication or to abandon these two areas, they will not be included in the future plans.

Considering only the Longmire and White River areas, initial work has been done on the entire control area of 3,581 acres. A total of 5,761 acres have been covered on rework including second and third workings with an estimated 1,431 acres requiring additional rework. In the control area in the Longmire and White River units there are approximately 2,150 acres on a maintenance basis. In addition to the regular ribes eradication program a project of canker elimination has been conducted on 1,091 acres. There still remain approximately 625 acres on which this work should be done on initial coverage and the total of 1,716 acres should be covered at least once more to save valuable trees.

For the 1943 season the minimum requirement would be a crew of at least 20 men, the actual number depending upon when work could be started. A majority of the time should be spent on the Longmire area doing rework which was not completed during the 1942 season in the Silver Forest area as well as needed rework on the Nisqually River above Longmire and on Paradise Creek. Some canker elimination should be done in the Silver Forest to prevent the unsightly appearance of dead branches. On the White River area a small amount of rework should be done at the public camp ground on the river and in some places rework should be done on areas worked late in the season of 1941. The canker elimination work here should be completed.

RESULTS

The following tables show statements of expenditures, results of the field work for 1942 and accumulative results for all work done to date.

TABLE 1

EXPENDITURES BY APPROPRIATIONS, CALENDAR YEAR 1942
MOUNT RAINIER NATIONAL PARK

Cooperating Agency	Appropriation	Amount
Bureau of Entomology and Plant Quarantine	Regular BLR-1-4	$1,216.46
National Park Service	Regular BLR-5	8,328.73
Total		$9,545.19

TABLE 2

CLASSIFIED EXPENDITURES, CALENDAR YEAR 1942
MOUNT RAINIER NATIONAL PARK

Item	Bureau of Entomology and Plant Quarantine Regular BLR-1-4	National Park Service Regular BLR-5	Total
Sal. perm. men	$ 999.94		$ 999.94
Personal Services		$7,976.34	7,976.34
Transportation	211.08	9.80	220.88
Contractual Services		21.29	21.29
Supplies and material		38.99	38.99
Equipment	5.44	282.31	287.75
Total	$1,216.46	$8,328.73	$9,545.19

TABLE 3

SUMMARY OF RIBES ERADICATION, 1942
MOUNT RAINIER NATIONAL PARK

Area	Working	Eradication Type	Acres	Effective Man-Days	Ribes by Species						Total Ribes	Per Acre Basis	
					Ribes lacustre	Ribes viscosissimum	Ribes bracteosum	Ribes watsonianum	Ribes lexiflorum	Ribes acerifolium		Man-Days	Ribes
Longmire	Second	Reproduction	71	174	1,217		35			1,462	2,714	2.45	38
	Third	Reproduction	112	299	1,042		456		51	1,425	2,974	2.67	27
	All Workings	Reproduction	183	473	2,259		491		51	2,887	5,688	2.58	31
White River	Third	Pole	1,644	570	524	640		241		4,326	5,731	.35	3
		Stream	377	128	2,159	15	193			4	2,371	.34	6
		All Types	2,021	698	2,683	655	193	241		4,330	8,102	.35	4
All Areas	Second	Reproduction	71	174	1,217		35			1,462	2,714	2.45	38
	Third	Reproduction	112	299	1,042		456		51	1,425	2,974	2.67	27
		Pole	1,644	570	524	640		241		4,326	5,731	.35	3
		All Upland	1,756	869	1,566	640	456	241	51	5,751	8,705	.49	5
		Stream	377	128	2,159	15	193			4	2,371	.34	6
		All Types	2,133	997	3,725	655	649	241	51	5,755	11,076	.47	5
	All Workings	Reproduction	183	473	2,259		491		51	2,887	5,688	2.58	31
		Pole	1,644	570	524	640		241		4,326	5,731	.35	3
		All Upland	1,827	1,043	2,783	640	491	241	51	7,213	11,419	.57	6
		Stream	377	128	2,159	15	193			4	2,371	.34	6
		All Types	2,204	1,171	4,942	655	684	241	51	7,217	13,790	.53	6

TABLE 4

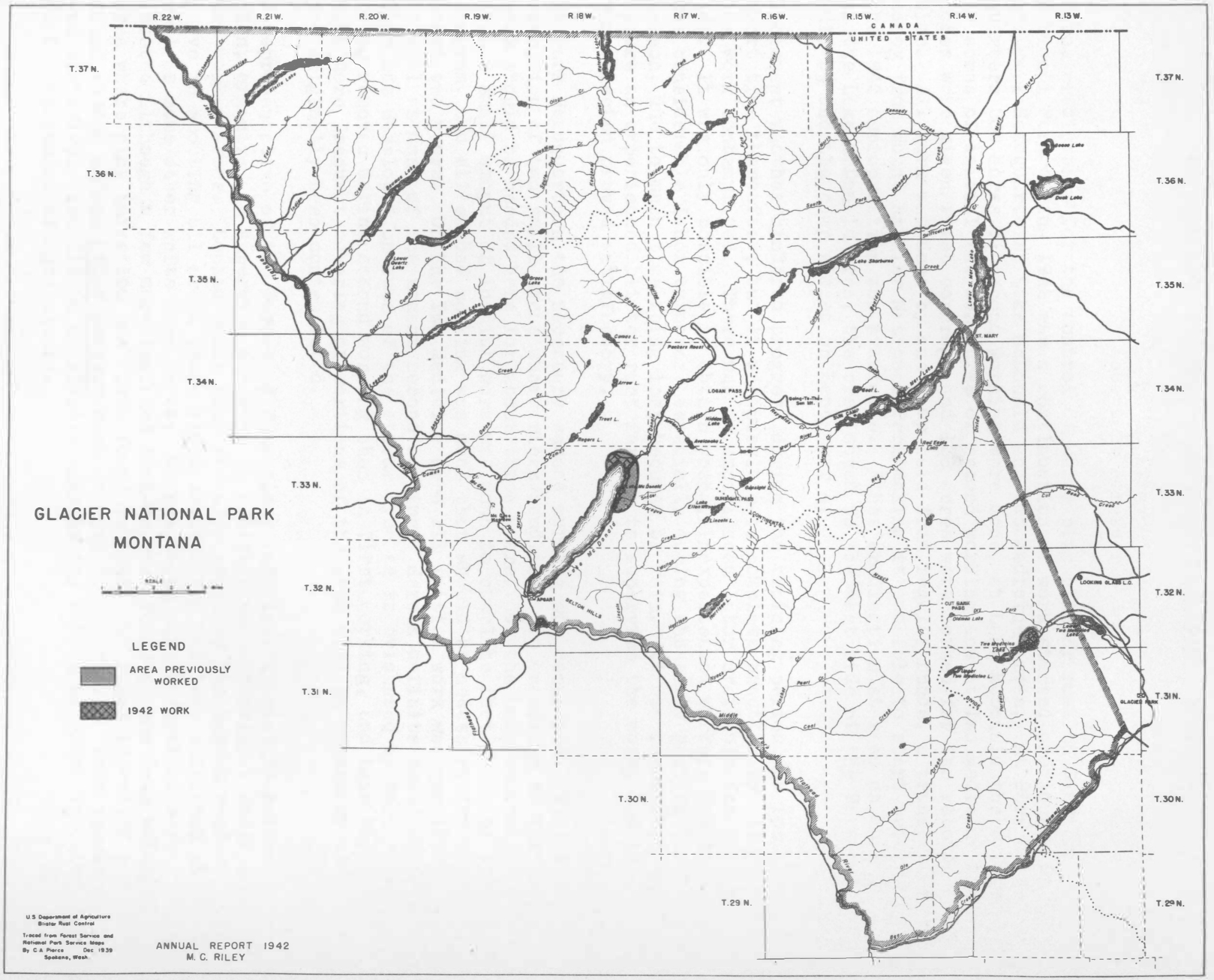
SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1930-1942
MOUNT RAINIER NATIONAL PARK

Working	Class	Acres	Effective Man-Days	Total Ribes	Per Acre Basis	
					Man-Days	Ribes
First	NP-Reg.	2,647	3,806	780,171	1.44	295
	NP-CCC	5,607	6,264	860,336	1.12	153
	Total	8,254	10,070	1,640,507	1.22	199
Second	NP-Reg.	766	569	19,395	.74	25
	NP-CCC	4,262	5,372	381,518	1.26	90
	Total	5,028	5,941	400,913	1.18	80
Third	NP-Reg.	2,853	1,853	42,911	.65	15
	NP-CCC	1,091	1,056	51,313	.97	47
	Total	3,944	2,909	94,224	.74	24
All Workings	NP-Reg.	6,266	6,228	842,477	.99	134
	NP-CCC	10,960	12,692	1,293,167	1.16	118
	Total	17,226	18,920	2,135,644	1.10	124

TABLE 5

SUMMARY OF RIBES ERADICATION, 1930-1942
MOUNT RAINIER NATIONAL PARK

Working	Area	Eradication Type	Acres	Effective Man-Days	Ribes by Species: Ribes lacustre	Ribes viscosissimum	Ribes bracteosum	Ribes watsonianum	Ribes laxiflorum	Ribes acerifolium	Ribes sanguineum	Ribes triste	Total Ribes	Per Acre Man-Days	Basis Ribes
First	Longmire	Reproduction	274	397	40,281		1,101		5,409	5,804			52,595	1.45	192
		Stream	626	1,202	185,687		97,774		53,899	2,838	16		340,214	1.92	543
		All Types	900	1,599	225,968		98,875		59,308	8,642	16		392,809	1.78	436
	Stevens Canyon	Reproduction	2,351	218	28,071		15,986				7,915		51,972	.09	22
		Pole	704	38	176		1,052				16		1,244	.05	2
		All Upland	3,055	256	28,247		17,038				7,931		53,216	.08	17
		Stream	1,192	4,741	72,360	2,055	440,386		914	11	3,959		519,685	3.98	436
		All Types	4,247	4,997	100,607	2,055	457,424		914	11	11,890		572,901	1.18	135
	White River	Reproduction	66	50	6,869	239	21	1,133	550	194			9,006	.76	136
		Pole	1,870	2,087	173,780	69,529	539	139,238	1,189	10,801	91	744	395,911	1.12	212
		Mature	322	264	27,327	12,847			5	45			40,224	.82	125
		All Upland	2,258	2,401	207,976	82,615	560	140,371	1,744	11,040	91	744	445,141	1.06	197
		Stream	423	744	162,856	1,510	4,869	242	8,820	188	98	8	178,591	1.76	422
		All Types	2,681	3,145	370,832	84,125	5,429	140,613	10,564	11,228	189	752	623,732	1.17	233
	Starbo	Reproduction	48	21	68	7		7		2,305			2,387	.44	50
		Pole	332	262	11,276	6,131		6,723	3,221	16,658			44,009	.79	133
		All Upland	380	283	11,344	6,138		6,730	3,221	18,963			46,396	.74	122
		Stream	46	46	2,663	575		476	546	409			4,669	1.00	102
		All Types	426	329	14,007	6,713		7,206	3,767	19,372			51,065	.77	120
	All Areas	Reproduction	2,739	686	75,289	246	17,108	1,140	5,959	8,303	7,915		115,960	.25	42
		Pole	2,906	2,387	185,232	75,560	1,591	145,961	4,410	27,459	107	744	441,164	.82	152
		Mature	322	264	27,327	12,847			5	45			40,224	.82	125
		All Upland	5,967	3,337	287,848	98,753	18,699	147,101	10,374	35,807	8,022	744	597,348	.56	100
		Stream	2,287	6,733	423,566	4,140	543,029	718	64,179	3,446	4,073	8	1,043,159	2.94	456
		All Types	8,254	10,070	711,414	92,893	561,728	147,819	74,553	39,253	12,095	752	1,640,507	1.22	199
Second	Longmire	Reproduction	274	271	10,961		1,136			1,462			13,559	.99	49
		Stream	614	526	19,977		23,196		2,394	1,426	50		47,043	.86	77
		All Types	888	797	30,938		24,332		2,394	2,888	50		60,602	.90	68
	Stevens Canyon	Stream	787	2,532	49,131	95	171,224				607		221,057	3.22	281
	White River	Reproduction	66	12	221			77					298	.19	5
		Pole	2,194	1,768	36,284	14,304	2,176	6,864	16,224	4,537			80,389	.81	37
		Mature	322	47	1,278	2,011							3,289	.15	10
		All Upland	2,582	1,827	37,783	16,315	2,176	6,941	16,224	4,537			83,976	.71	33
		Stream	394	657	32,748		154		5				32,907	1.67	84
		All Types	2,976	2,484	70,531	16,315	2,330	6,941	16,229	4,537			116,883	.83	39
	All Areas	Reproduction	340	283	11,182		1,136	77		1,462			13,857	.83	41
		Pole	2,194	1,768	36,284	14,304	2,176	6,864	16,224	4,537			80,389	.81	37
		Mature	322	47	1,278	2,011							3,289	.15	10
		All Upland	2,856	2,098	48,744	16,315	3,312	6,941	16,224	5,999			97,535	.73	34
		Stream	1,795	3,715	101,856	95	194,574		2,399	1,426	657		301,007	2.07	168
		All Types	4,651	5,813	150,600	16,410	197,886	6,941	18,623	7,425	657		398,542	1.25	86
Third	Longmire	Reproduction	154	398	8,861		701		56	1,682			11,310	2.58	73
		Stream	489	472	15,619		6,562		316	46	6		22,549	97	46
		All Types	643	870	24,480		7,263		382	1,728	6		33,859	1.35	53
	Stevens Canyon	Stream	220	561	712		23,384						24,096	2.50	110
	White River	Pole	2,603	1,209	1,384	3,196		10,515	20	4,883			19,998	.46	8
		Stream	855	407	15,440	2,268	227		703	4			18,642	.48	22
		All Types	3,458	1,616	16,824	5,464	227	10,515	723	4,887			38,640	.47	11
	All Areas	Reproduction	154	398	8,861		701		66	1,682			11,310	2.58	73
		Pole	2,603	1,209	1,384	3,196		10,515	20	4,883			19,998	.46	8
		All Upland	2,757	1,607	10,245	3,196	701	10,515	86	6,565			31,308	.58	11
		Stream	1,564	1,430	31,771	2,268	30,173		1,019	50	6		65,287	.91	42
		All Types	4,321	3,037	42,016	5,464	30,874	10,515	1,105	6,615	6		96,595	.70	22
All Workings	Longmire	Reproduction	702	1,066	60,103		2,938		5,475	8,948			77,464	1.52	110
		Stream	1,729	2,200	221,283		127,532		56,609	4,310	72		409,806	1.27	237
		All Types	2,431	3,266	281,386		130,470		62,084	13,258	72		487,270	1.34	200
	Stevens Canyon	Reproduction	2,351	218	28,071		15,986				7,915		51,972	.09	22
		Pole	704	38	176		1,052				16		1,244	.05	2
		All Upland	3,055	256	28,247		17,038				7,931		53,216	.08	17
		Stream	2,199	7,824	122,203	2,150	634,994		914	11	4,566		764,838	3.56	348
		All Types	5,254	8,080	150,450	2,150	652,032		914	11	12,497		818,054	1.54	156
	White River	Reproduction	132	62	7,090	239	21	1,210	550	194			9,304	.47	70
		Pole	6,667	5,064	211,448	87,029	2,715	156,617	17,433	20,221	91	744	496,298	.76	74
		Mature	644	311	28,605	14,858			5	45			43,513	.48	68
		All Upland	7,443	5,437	247,143	102,126	2,736	157,827	17,988	20,460	91	744	549,115	.73	74
		Stream	1,672	1,808	211,044	3,778	5,250	242	9,528	192	98	8	230,140	1.08	138
		All Types	9,115	7,245	458,187	105,904	7,986	158,069	27,516	20,652	189	752	779,255	.79	85
	Starbo	Reproduction	48	21	68	7		7		2,305			2,387	.44	50
		Pole	332	262	11,276	6,131		6,723	3,221	16,658			44,009	.79	133
		All Upland	380	283	11,344	6,138		6,730	3,221	18,963			46,396	.74	122
		Stream	46	46	2,663	575		476	546	409			4,669	1.00	102
		All Types	426	329	14,007	6,713		7,206	3,767	19,372			51,065	.77	120
	All Areas	Reproduction	3,233	1,367	95,332	246	18,945	1,217	6,025	11,447	7,915		141,127	.42	44
		Pole	7,703	5,364	222,900	93,160	3,767	163,340	20,654	36,879	107	744	541,551	.70	70
		Mature	644	311	28,605	14,858			5	45			43,513	.48	68
		All Upland	11,580	7,042	346,837	108,264	22,712	164,557	26,684	48,371	8,022	744	726,191	.61	63
		Stream	5,646	11,878	557,193	6,503	767,776	718	67,597	4,922	4,736	8	1,409,453	2.10	250
		All Types	17,226	18,920	904,030	114,767	790,488	165,275	94,281	53,293	12,758	752	2,135,644	1.10	124


R.22 W.
R.21 W.
R.20 W.
R.19 W.
R.18 W.
R.17 W.
R.16 W.
R.15 W.
R.14 W.
R.13 W.
CANADA
UNITED STATES
T.37 N.
T.36 N.
T.35 N.
T.34 N.
T.33 N.
T.32 N.
T.31 N.
T.30 N.
T.29 N.
GLACIER NATIONAL PARK
MONTANA
SCALE
LEGEND
AREA PREVIOUSLY WORKED
1942 WORK
Lake Mc Donald
LOGAN PASS
GUNSIGHT PASS
BELTON HILLS
ST. MARY
LOOKING GLASS L.O.
GLACIER PARK
U.S. Department of Agriculture
Division Rust Control
Traced from Forest Service and National Park Service Maps
By C.A. Pierce Dec 1939
Spokane, Wash.
ANNUAL REPORT 1942
M. C. RILEY

BLISTER RUST CONTROL, GLACIER NATIONAL PARK, 1942

By
M. C. Riley
Associate Forester

Ribes eradication for the control of white pine blister rust on Glacier National Park during 1942 was a continuation of work started previously on the Park Headquarters, Lake McDonald and Two Medicine areas. At Park Headquarters 300 acres of second working were done, at Lake McDonald there were 10 acres of initial and 293 acres of second working and at Two Medicine 252 acres were given first coverage and 138 acres were worked for the second time. All work was done by one camp paid from regular funds, a transfer of money from Mount Rainier National Park making it possible to start before the 1943 appropriation was available. Ribes eradication started on June 9 on the Lake McDonald area, the crew moved to the east side of the Park on July 24 and the camp closed on September 4.

Inclement weather hindered progress during the training period and for a short time thereafter, but it was possible to complete practically all of the work contemplated. There was no experienced labor available for the job. It was only possible to obtain young, inexperienced workers and there was considerable labor turnover, especially during the early part of the season, due to much time being lost because of rain. It was impossible to secure an experienced blister rust foreman to supervise the work, but the man selected proved satisfactory.

At Park Headquarters the necessary second working was completed. With the exception of two small areas where ribes seedlings are occurring no further work should be needed here for about three years. On the Lake McDonald area a small amount of initial work was done to complete that phase of the program, and all second working was done that should be necessary for at least two years. On the Two Medicine area all initial work was completed as well as most of the urgent second working. Here a definite seedling problem has developed on some of the stream type as is evidenced by more ribes being removed during second working than in first working, and this may mean that more frequent covering of portions of the area will be necessary than had originally been contemplated.

A representative of the Bureau of Entomology and Plant Quarantine helped plan, organize and supervise the work in addition to performing a check on the worked areas. Considerable time was also spent by the Bureau representative in scouting all areas where ribes eradication has been initiated as well as some other white pine areas. No new white pine infections were located although a few more isolated cankers were found on the Lake McDonald area where pine infection was first found in 1941. No ribes infection was found except on one Ribes setosum bush at Park Headquarters. This specimen was tentatively identified as blister rust by the Bureau of Plant Industry, U. S. Department of Agriculture.

RECOMMENDATIONS

This was the first year that regular funds had been used at Glacier National Park, and initial working was completed on the Lake McDonald and Two Medicine areas while second working was done on all three areas. Of the total of 3,194 acres where work has been started, 2,895 acres have been given initial working and 731 acres have been reworked. There are 2,280 acres on a maintenance basis, and there remain 299 acres to be worked for the first time and approximately 615 acres needing rework.

For the 1943 field season a 35-man camp should be employed for those areas where work has already been started. This would assure the completion of urgent rework at Two Medicine as well as the finishing of the initial work started at East Glacier in 1939.

If ribes eradication is started on the Oldman Lake area a 30-man camp will be required since the season would be comparatively short there. It is understood that there is a possibility of using men from a Civilian Public Service camp to do work on the Fern Creek area. Depending upon the availability of men and the date work starts, it is estimated that a 20- to 25-man crew should be used there.

RESULTS

The following tables show the statements of expenditures, results of the field work for 1942 and accumulative results for all work done to date.

TABLE 1

EXPENDITURES BY APPROPRIATIONS, CALENDAR YEAR 1942
GLACIER NATIONAL PARK

Cooperating Agency	Appropriation	Amount
Bureau of Entomology and Plant Quarantine	Regular BLR-1-4	$ 1,559.68
National Park Service	Regular BLR-5	8,755.42
Total		$10,315.10

TABLE 2

CLASSIFIED EXPENDITURES, CALENDAR YEAR 1942
GLACIER NATIONAL PARK

Item	Bureau of Entomology and Plant Quarantine Regular BLR-1-4	National Park Service BLR-5	Total
Sal. perm. men	$1,291.58		$ 1,291.58
Personal Services		$7,487.00	7,487.00
Transportation	262.66	15.43	278.09
Contractual Services		246.79	246.79
Supplies and Material		918.14	918.14
Equipment	5.44	88.06	93.50
Total	$1,559.68	$8,755.42	$10,315.10

TABLE 3

SUMMARY OF RIBES ERADICATION, 1942
GLACIER NATIONAL PARK

Area	Working	Eradication Type	Acres	Effective Man-Days	Ribes by Species				Total Ribes	Per Acre Basis	
					Ribes lacustre	Ribes viscosissimum	Ribes setosum	Ribes inerme		Man-Days	Ribes
Park Headquarters	Second	Reproduction	134	39	2,876	581	558		4,015	.29	30
		Pole	127	79	376	964	535		1,875	.62	15
		Brush	39	52	13	973	67	2	1,055	1.33	27
		All Types	300	170	3,265	2,518	1,160	2	6,945	.57	23
Two Medicine	First	Pole	247	256	23,371	132		5,793	29,296	1.04	119
		Stream	5	16	2,104	4		277	2,385	3.20	477
		All Types	252	272	25,475	136		6,070	31,681	1.08	126
	Second	Pole	90	93	11,318	250		5,658	17,226	1.03	191
		Subalpine	16	20	1,495	67		2,471	4,033	1.25	252
		All Upland	106	113	12,813	317		8,129	21,259	1.07	201
		Stream	32	156	46,233	14		25,259	71,506	4.88	2,235
		All Types	138	269	59,046	331		33,388	92,765	1.95	672
	All Workings	Pole	337	349	34,689	382		11,451	46,522	1.04	138
		Subalpine	16	20	1,495	67		2,471	4,033	1.25	252
		All Upland	353	369	36,184	449		13,922	50,555	1.05	143
		Stream	37	172	48,337	18		25,536	73,891	4.65	1,997
		All Types	390	541	84,521	467		39,458	124,446	1.39	319
Lake McDonald	First	Mature	10	29	630	226	4,618		5,474	2.90	547
	Second	Mature	282	303	3,173	1,305	15,996		20,474	1.07	73
		Stream	11	21	998	130	1,294		2,422	1.91	220
		All Types	293	324	4,171	1,435	17,290		22,896	1.11	78
	All Workings	Mature	292	332	3,803	1,531	20,614		25,948	1.14	89
		Stream	11	21	998	130	1,294		2,422	1.91	220
		All Types	303	353	4,801	1,661	21,908		28,370	1.17	94
All Areas	First	Pole	247	256	23,371	132		5,793	29,296	1.04	119
		Mature	10	29	630	226	4,618		5,474	2.90	547
		All Upland	257	285	24,001	358	4,618	5,793	34,770	1.11	135
		Stream	5	16	2,104	4		277	2,385	3.20	477
		All Types	262	301	26,105	362	4,618	6,070	37,155	1.15	142
	Second	Reproduction	134	39	2,876	581	558		4,015	.29	30
		Pole	217	172	11,694	1,214	535	5,658	19,101	.79	88
		Mature	282	303	3,173	1,305	15,996		20,474	1.07	73
		Brush	39	52	13	973	67	2	1,055	1.33	27
		Subalpine	16	20	1,495	67		2,471	4,033	1.25	252
		All Upland	688	586	19,251	4,140	17,156	8,131	48,678	.85	71
		Stream	43	177	47,231	144	1,294	25,259	73,928	4.12	1,719
		All Types	731	763	66,482	4,284	18,450	33,390	122,606	1.04	168
	All Workings	Reproduction	134	39	2,876	581	558		4,015	.29	30
		Pole	464	428	35,065	1,346	535	11,451	48,397	.92	104
		Mature	292	332	3,803	1,531	20,614		25,948	1.14	89
		Brush	39	52	13	973	67	2	1,055	1.33	27
		Subalpine	16	20	1,495	67		2,471	4,033	1.25	252
		All Upland	945	871	43,252	4,498	21,774	13,924	83,448	.92	88
		Stream	48	193	49,335	148	1,294	25,536	76,313	4.02	1,590
		All Types	993	1,064	92,587	4,646	23,068	39,460	159,761	1.07	161

TABLE 4

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1939-1942
GLACIER NATIONAL PARK

Working	Class	Acres	Effective Man-Days	Total Ribes	Per Acre Basis	
					Man-Days	Ribes
First	NP-Reg.	262	301	37,155	1.15	142
	NP-CCC	2,633	2,833	323,841	1.08	123
	Total	2,895	3,134	360,996	1.08	125
Second	NP-Reg.	731	763	122,606	1.04	168
All Workings	NP-Reg.	993	1,064	159,761	1.07	161
	NP-CCC	2,633	2,833	323,841	1.08	123
	Total	3,626	3,897	483,602	1.07	133

TABLE 5

SUMMARY OF RIBES ERADICATION, 1939-1942
GLACIER NATIONAL PARK

Area	Working	Eradication Type	Acres	Effective Man-Days	Ribes by Species				Total Ribes	Per Acre Basis	
					Ribes lacustre	Ribes viscosissimum	Ribes setosum	Ribes inerme		Man-Days	Ribes
Park Headquarters	First	Reproduction	358	204	9,869	6,472	15,666		32,007	.57	89
		Pole	284	122	13,428	15,364	8,967		37,759	.43	133
		Brush	39	119	9,411	21,340	8,353		39,104	3.05	1,003
		All Types	681	445	32,708	43,176	32,986		108,870	.65	160
	Second	Reproduction	134	39	2,876	581	558		4,015	.29	30
		Pole	127	79	376	964	535		1,875	.62	15
		Brush	39	52	13	973	67	2	1,055	1.33	27
		All Types	300	170	3,265	2,518	1,160	2	6,945	.57	23
	All Workings	Reproduction	492	243	12,745	7,053	16,224		36,022	.49	73
		Pole	411	201	13,804	16,328	9,502		39,634	.49	96
		Brush	78	171	9,424	22,313	8,420	2	40,159	2.19	515
		All Types	981	615	35,973	45,694	34,146	2	115,815	.63	118
Two Medicine	First	Pole	593	645	40,145	2,705	1,723	8,646	53,219	1.09	90
		Subalpine	60	118	3,935	1,050	4,665	1,834	11,484	1.97	191
		All Upland	653	763	44,080	3,755	6,388	10,480	64,703	1.17	99
		Stream	54	480	30,429	438		12,592	43,459	8.89	805
		All Types	707	1,243	74,509	4,193	6,388	23,072	108,162	1.76	153
	Second	Pole	90	93	11,318	250		5,658	17,226	1.03	191
		Subalpine	16	20	1,495	67		2,471	4,033	1.25	252
		All Upland	106	113	12,813	317		8,129	21,259	1.07	201
		Stream	32	156	46,233	14		25,259	71,506	4.88	2,235
		All Types	138	269	59,046	331		33,388	92,765	1.95	672
	All Workings	Pole	683	738	51,463	2,955	1,723	14,304	70,445	1.08	103
		Subalpine	76	138	5,430	1,117	4,665	4,305	15,517	1.82	204
		All Upland	759	876	56,893	4,072	6,388	18,609	85,962	1.15	113
		Stream	86	636	76,662	452		37,851	114,965	7.40	1,337
		All Types	845	1,512	133,555	4,524	6,388	56,460	200,927	1.79	238
Lake McDonald	First	Mature	1,410	913	21,077	4,253	34,175		59,505	.65	42
		Stream	11	39	5,184	35	1,602		6,821	3.55	620
		All Types	1,421	952	26,261	4,288	35,777		66,326	.67	47
	Second	Mature	282	303	3,173	1,305	15,996		20,474	1.07	73
		Stream	11	21	998	130	1,294		2,422	1.91	220
		All Types	293	324	4,171	1,435	17,290		22,896	1.11	78
	All Workings	Mature	1,692	1,216	24,250	5,558	50,171		79,979	.72	47
		Stream	22	60	6,182	165	2,896		9,243	2.73	420
		All Types	1,714	1,276	30,432	5,723	53,067		89,222	.74	52
East Glacier	First	Pole	86	494	24,077	5,650	6,738	41,173	77,638	5.74	903
All Areas	First	Reproduction	358	204	9,869	6,472	15,666		32,007	.57	89
		Pole	963	1,261	77,650	23,719	17,428	49,819	168,616	1.31	175
		Mature	1,410	913	21,077	4,253	34,175		59,505	.65	42
		Brush	39	119	9,411	21,340	8,353		39,104	3.05	1,003
		Subalpine	60	118	3,935	1,050	4,665	1,834	11,484	1.97	191
		All Upland	2,830	2,615	121,942	56,834	80,287	51,653	310,716	.92	110
		Stream	65	519	35,613	473	1,602	12,592	50,280	7.98	774
		All Types	2,895	3,134	157,555	57,307	81,889	64,245	360,996	1.08	125
	Second	Reproduction	134	39	2,876	581	558		4,015	.29	30
		Pole	217	172	11,694	1,214	535	5,658	19,101	.79	88
		Mature	282	303	3,173	1,305	15,996		20,474	1.07	73
		Brush	39	52	13	973	67	2	1,055	1.33	27
		Subalpine	16	20	1,495	67		2,471	4,033	1.25	252
		All Upland	688	586	19,251	4,140	17,156	8,131	48,678	.85	71
		Stream	43	177	47,231	144	1,294	25,259	73,928	4.12	1,719
		All Types	731	763	66,482	4,284	18,450	33,390	122,606	1.04	168
	All Workings	Reproduction	492	243	12,745	7,053	16,224		36,022	.49	73
		Pole	1,180	1,433	89,344	24,933	17,963	55,477	187,717	1.21	159
		Mature	1,692	1,216	24,250	5,558	50,171		79,979	.72	47
		Brush	78	171	9,424	22,313	8,420	2	40,159	2.19	515
		Subalpine	76	138	5,430	1,117	4,665	4,305	15,517	1.82	204
		All Upland	3,518	3,201	141,193	60,974	97,443	59,784	359,394	.91	102
		Stream	108	696	82,844	617	2,896	37,851	124,208	6.44	1,150
		All Types	3,626	3,897	224,037	61,591	100,339	97,635	483,602	1.07	133

COOPERATION WITH THE SOIL CONSERVATION SERVICE

By
M. C. Riley
Associate Forester

During the course of the spring and early summer two survey jobs were undertaken by this Bureau at the request of the Soil Conservation Service to furnish data concerning white pine blister rust and ribes conditions on specific areas. One request was for a survey of the Soil Conservation Service nursery at Bellingham, Washington, and the other was in connection with the farm wood lot program in the Kootenai County Soil Conservation District in Idaho.

Bellingham Nursery

This nursery of approximately 75 acres is located at the north city limits of Bellingham, Washington, and is the old Bureau of Plant Industry Bulb Nursery plus recent additions. It was planned to plant enough seed to raise approximately 10,000 western white pine.

A survey was made of the nursery including a surrounding protection strip, on May 12 and 13, 1942. No blister rust infection was found and there were few ribes within infecting distance. These consisted of Ribes lacustre and R. sanguineum, and it was estimated that their removal would require approximately 20 man-days.

A detailed report was submitted and copies are in the files of this Bureau.

Farm Wood Lots in Kootenai County Soil Conservation District in Idaho

An inspection of designated farm wood lots containing white pine was conducted during the months of April and May to determine the amount of blister rust infection and ribes on the areas. In reproduction stands trees were thoroughly examined for blister rust infection and in pole and mature stands the trees were observed for flags. Ribes population and distribution were determined by a strip sampling method on the wood lots and on a surrounding protection zone. The interval between strips was adjusted to show adequately the ribes conditions, and check strips and ribes data were plotted on a map for each area. During the course of the survey 530 acres were examined on 18 fields of 13 properties.

All types of working conditions, ribes concentrations and infection were found ranging from ribes-free area with no apparent infection to areas which have many ribes, and which are so heavily infected with blister rust that practically every tree will be lost.

In the detailed report submitted to the Soil Conservation Service, a map of the area surveyed on each property was supplied, and the blister rust problem was described. Copies of the detailed report are to be found in the files of this Bureau.

BLISTER RUST PLOT STUDIES

By
C. R. Stillinger
Assistant Pathologist

INTRODUCTION

As a part of the program to control white pine blister rust in the Inland Empire, studies of this disease on permanent plots were continued in 1942. The objective of these studies is to obtain information which will aid in a better understanding of the development of the rust under natural conditions and the effect upon this development of the various control operations. Due to the life history of the rust these plot studies must be continued for a rather long period in order to obtain reliable results. The observations each season, therefore, are only fragmentary indications of the trends of the studies and cannot be taken as conclusive. The pertinent information, which has been obtained during this past season, is given in the discussion of the various individual plots or combination of plots.

BLISTER RUST CONDITIONS IN 1942

The past summer was characterized by about normal temperatures, but a deficiency of moisture during all the summer months except June. August and September were dry so that very little opportunity was present for pine infection. Occasional rains throughout the summer provided favorable conditions for the intensification of the rust on ribes and for the germination of the telia. This greater intensification of the rust on ribes in comparison with that of previous seasons is shown in table 1. In this table the amount of infection has been reduced to square inches of infection per infected leaf and per foot of all live stem found on the plot in order to make the data comparable. Records are given for as many years as data are available for the several plots.

TABLE 1

AMOUNT OF BLISTER RUST FOUND FOR SUCCESSIVE YEARS ON STUDY PLOTS DISTRIBUTED OVER NORTHERN IDAHO

Plot	Operation	Sq. In. Infection Per Infected Leaf				Sq. In. Infection Per FLS			
		1939	1940	1941	1942	1939	1940	1941	1942
Powder House Plot	Clearwater	.153	.152	.199	.283	.374	.316	.301	.860
Trail Creek Plot 4	Clearwater	.180	.312	.487	.632	.784	2.061	3.836	4.235
Trail Creek Plot 6	Clearwater		.067	.057	.090		.081	.279	.509
Trail Creek Plot 7	Clearwater		.087	.093	.058		.197	.529	.671
Hollywood Plot 9	Clearwater		.209	.121	.146		1.113	.415	.484
East Emerald Plot 18	St. Joe	.024	.023	.025	.078	.011	.006	.073	.348
East Emerald Plot 20	St. Joe	.105	.064	.344	.397	.207	.044	.993	.624
East Emerald Plot 21	St. Joe			.061	.077			.326	.510
Kalispell Cr.Plot 24	Kaniksu			.090	.127			.230	.389
Kalispell Cr.Plot 25	Kaniksu			.051	.075			.062	.406
Kalispell Cr.Plot 26	Kaniksu			.022	.061			.009	.165
Average		.116	.131	.141	.184	.344	.544	.641	.831

From the table it is evident that whether the amount of infection per infected leaf or per feet of live stem is used as a basis for comparison the general trends are very much the same.

The most interesting point revealed by these data is the gradual increase in the amount of rust each season. There are two probable reasons for this increase, both of which have contributed as causes: (1) that there has been a gradual increase in the amount of aeciospores on and in the vicinity of the plots and (2) the ecological conditions each year have been more favorable than those of the previous season for the intensification of the rust on ribes. Since the plots are on three separate operations, the data suggest that approximately the same development of the rust on ribes may prevail over all of the Inland Empire white pine area. These data suggest that in an area with some pine infected with blister rust the ribes should be eradicated as rapidly as possible.

PERTINENT RESULTS FROM INDIVIDUAL PLOTS

Kalispell Creek Plots 24, 25 and 26

These three plots on the Kaniksu operation were located last year in 1933 white pine plantings and a preliminary report given of the results obtained from the initial survey. This year all details in the establishment of the plots were completed, a careful inspection and record were made of all infected pine, the ribes were eradicated from a protection zone of five chains around each plot and the ribes were reduced to a definite standard which is to be maintained annually on each plot. Because of local conditions the areas of plots 24 and 26 were increased slightly in size and plot 24 was divided into three subplots. Following are some of the detailed findings for this season:

Pine Infection

All white pine on the plots were inspected, the infected trees and all cankers were numbered and detailed records taken on the trees and cankers. Furthermore, all branch cankers were cut off which were close to the trunk and were on trees which did not already have trunk cankers. This practice will be continued and limb cankers will be removed before entering the trunk on trees that do not already have trunk cankers. This procedure is for the purpose of maintaining an adequate stocking of pine on the plots on which to study future spread of infection from ribes. The results of this inspection are given in table 2.

TABLE 2

SUMMARY OF PINE INFECTION, CUTTING OUT OF CANKERS, AND RIBES CONDITIONS ON KALISPELL CREEK PLOTS

Items		Plot 24				Plot 25	Plot 26
		Part I	Part II	Part III	All		
Area - Acres		7.1	19.2	7.4	33.7	9.2	13.1
White Pine	Total	1,910	3,483	1,046	6,479	3,052	5,295
	No. Per Acre	269	181	141	192	332	404
	Per Cent Infected	7.43	5.89	14.39	7.77	5.24	4.6
	No. Cankers	149	218	231	598	175	309
	No. Cankers Per 100 Trees	7.8	6.3	22.1	9.2	5.7	5.8
	No. Trees With Limb Cankers Only	31	72	44	147	27	75
	No. Trees - Limb Cankers Removed	27	56	23	106	26	50
	Per Cent Infected Trees - Limb Cankers Removed	19.0	27.3	14.7	21.0	16.3	20.4
	Per Cent Infected Trees With Trunk Cankers	78.2	64.9	71.8	70.8	83.1	69.3
Ribes	No. Per Acre	2.1	1.8	14.5	5.2	2.9	7.9*
	No. Per Acre After Reduction	1.1*	.9	2.7**	1.4	1.2*	2.9*
	Feet Live Stem Per Acre	21.1	22.9	366.1	97.8	159.4	216.1
	Feet Live Stem Per Acre After Reduction	11.8*	15.6	17.1*	15.3	21.1*	11.5*

*All Ribes lacustre
**All R. viscosissimum

From table 2 the following points may be observed:

1. The plots differ considerably in size. This difference was necessitated by general topography of each location.

2. The infection of part I of plot 24 and plots 25 and 26 was spread from R. lacustre with from two to eight ribes per acre and from 21 to 216 feet of live stem per acre.

3. The percentage of infection does not appear to be correlated with either the number of ribes or feet of live stem per acre. From studies made on other plots it appears that the distribution of the rust on the pine is characteristic for the introductory phase of the rust.

4. Limb cankers which were close to the trunk were removed from 20 per cent of all the infected trees on all three plots.

5. Seventy-two per cent of all the infected trees on all three plots had trunk cankers.

Establishment of Experimental Standards

In order to determine the influence of small amounts of ribes and feet of live stem upon the transfer of blister rust to pine approximate standards were established for each plot. The number of ribes was reduced approximately to standard by eradicating some of the bushes. If possible, each plot was reduced to a single species of ribes. The live stem on the bushes which were left was and will be pruned back in early July in order to obtain approximately the same amount of live stem each year. The program and results for this past season are indicated in table 3.

TABLE 3

REDUCTIONS OF RIBES ON PLOTS TO SPECIFIC STANDARDS

Plot	Original Per Acre		Standard Per Acre		Ribes Species	July Reduction and Pruning Per Acre		August Inspection Per Acre	
	Ribes	FLS	Ribes	FLS		Ribes	FLS	Ribes	FLS
24-1	2.1	21	1	10	lacustre	1.1	11.8	1.1	11.8
24-2	1.8	23	1	16	lacustre and viscosissimum	.9	15.6	.9	15.6
24-3	14.5	366	3	16	viscosissimum	2.7	14.0	2.7	17.1
25	2.9	159	1.3	20	lacustre	1.2	15.8	1.2	21.1
26	7.9	216	2.3	10	lacustre	2.9	8.96	2.9	11.5

Pruning of ribes, in order to reduce the feet of live stem to near the standard, was done on plot 24, part 3, and plots 25 and 26. In each case where pruning of the ribes was done the feet of live stem was reduced in July under the standard, but there was from 20 to 33 per cent increase when the ribes were inspected in August over that left in July. This increase was due probably to stimulation from the pruning as well as natural growth. These results suggest that maintaining feet of live stem standards by means of pruning can be done only within rather broad limits.

Protection Zone

In order that the results from the plots may be more certain the ribes in a zone of five chains width around each plot were eradicated. Table 4 gives a summary of the results of this eradication.

TABLE 4

RIBES FOUND IN FIVE CHAIN WIDE PROTECTION ZONE AROUND THE PLOTS

Plot	Area-Acres	Ribes Species	Ribes		Feet of Live Stem	
			Total	Per Acre	Total	Per Acre
24	66.2	R. lacustre	61	.9	705	10.6
		R. viscosissimum	614	9.3	16,388	247.6
		Total	675	10.2	17,093	258.2
25	22.1	R. lacustre	46	2.1	671	30.4
26	38.1	R. lacustre	97	2.6	1,867	49.0
		R. viscosissimum	1		45	1.2
		Total	98	2.6	1,912	50.2
Total	126.4		819	6.5	19,676	155.7

Comparing these results with the ribes found on the plots (table 2) it may be observed that the ribes population around plot 24 is twice that on the plot and the feet of live stem 2.6 times. This difference was due to a heavy concentration of ribes in one area on the west side of the plot and another on the northeast corner of the plot. This concentration extended into the northeast corner of the plot. It will be necessary to rework these two areas again next year. In the case of plot 25 the surrounding area did not have quite as many ribes per acre or as much live stem as was found on the plot. The considerable difference in live stem was due to a few large ribes found along the small stream on the plot.

Fewer ribes and feet of live stem per acre were found around plot 26 than on the plot itself. This was due to the swampy area on the plot on which a considerable concentration of ribes was found. Since the areas involved in this plot work are fairly large, the results from the careful examination of the areas both on the plots and around them for ribes should be of interest. For this reason all these data are summarized in table 5.

TABLE 5

SUMMARY OF ALL RIBES AND FEET OF LIVE STEM FOUND ON AND AROUND THE PLOTS

Plot	Area-Acres	Ribes		Feet of Live Stem	
		Total	Per Acre	Total	Per Acre
24	99.9	351	3.5	20,391	204
25 and 26	82.5	274	3.3	6,881	83
Total	182.4	1,125	6.2	27,272	150

Since plots 25 and 26 are contiguous on one side the data for these two have been combined. Plot 24 is about one-quarter mile northwest of the plot 25 to 26 area. Both areas had been burned over and were planted in 1933 with white pine. The ribes on the areas had not been eradicated previous to this study. These plots are also of particular value in studying the development of the rust because they are located in an area with relatively light ribes populations, varying from widely scattered ribes to small but heavy ribes concentrations. Such conditions represent special problems in both checking and eradication.

Trail Creek Plots 7 and 8

Both of these plots are on the Clearwater operation. The purpose of plot 7 is to study the infecting power of a single R. petiolare. Plot 8 is a study of a light distribution of R. lacustre. Both are well stocked with open reproduction. The plots were established in 1938 after the ribes had been eradicated from the area in 1933 and 1935. The plot areas were searched for ribes again in 1938, 1939 and 1942. The results of these last three eradications are given in table 6. This table indicates the difficulty which has been encountered in establishing a ribes-free area on these plots.

TABLE 6

RIBES REMOVED ON LAST THREE ERADICATIONS
ON TRAIL CREEK PLOTS 7 AND 8

	Number Ribes and FLS Found Per Acre for Same Area					
	1938		1939		1942	
Plot	Ribes	FLS	Ribes	FLS	Ribes	FLS
7	9	17	18	26	10	11
8	46	58	15	13	13	30

Of course, until all ribes have been removed from the area any pine infection which develops on the white pine cannot be charged definitely to the ribes which have been left for study. However, a careful record is kept of the location of all ribes which have been eradicated so that the relation of these ribes to any infection which develops may be determined.

Trail Creek Plot 6 and East Emerald Creek Plot 21

Trail Creek plot 6 on the Clearwater operation and East Emerald Creek plot 21 on the St. Joe operation both have the same objective, that is, a study of the infecting power of a R. lacustre population. The original population has been maintained until the 1942 season. This year all bushes were removed that were over approximately six inches high and had more than one foot of live stem. As a result of this eradication the plots for the next few years represent a study of the survival and infecting power of dwarf R. lacustre. In the case of plot 6, 48 per cent of the ribes and 87 per cent of the live stem were removed. For plot 21, 55 per cent of the ribes and 89 per cent of the live stem were removed.

Hollywood Plot 9

Hollywood plot 9 is a study of the development of blister rust on very young white pine reproduction on a cutover area. The white pine average about ten years old. A record has been kept of all ribes which have been found on this plot since 1939. Some new ribes have been found each year so that there has been a gradual increase in the number of ribes and the feet of live stem as shown in table 7.

TABLE 7

HISTORY OF RIBES POPULATION ON HOLLYWOOD PLOT 9

			1940			1942	
	1938	1939	Total	Reduced to	1941	Total	Reduced to
Ribes Per Acre	34	46	54	23	27	31	19
FLS Per Acre	113	191	254	96	123	144	19

Most of these new ribes are four to six year old dwarf plants which for some reason have not been found previously. Two reductions of the ribes have been made, one in 1940, the other in 1942, by eradicating some of the ribes. In 1942 a reduction in live stem was accomplished by pruning some of the bushes which were left.

During the fall of 1942 all the pine on the plot were inspected for white pine blister rust. Approximately 20 per cent of the trees was found to be infected. Since there are approximately 9,800 trees per acre, this infection has not caused any damage to the stocking of the area. Nearly nine per cent of infected trees have died during the last two years, mostly from infection which occurred in 1937.

NEW PLOTS

Hanna Road Plots 29 and 30

An area was found along the Hanna Road on the Kaniksu operation which offered an opportunity to obtain some information on the natural spread of white pine blister rust on a level area. The area originally supported a dense stand of mature timber. In 1935 and 1936 the decadent hemlock and fir was felled and all slash was piled and burned leaving an open stand of mature white pine with very little ground cover. Two locations with a small number of ribes in the center were chosen for plot studies. Since young pine one and two years old were quite abundant, all pine within two chains of the ribes were staked and inspected. Although a few pine were found with symptoms similar to those of white pine blister rust, the pine were so young that positive identification was not possible. Some ribes other than those in the center of the plots were found and eradicated. It will be necessary to eradicate the ribes from the plots again next spring as well as establish a protection zone around the plots.

SUMMARY

1. The climate this last summer probably was not especially favorable for the infection of white pine by blister rust.

2. There has been a progressive increase in the amount of rust on ribes for the last four years.

3. Two to eight ribes per acre with 20 to 216 feet of live stem may initiate a serious amount of infection in young planted white pine.

4. Limb cankers which were close to the trunk were removed from 20 per cent of the infected trees.

5. Seventy-two per cent of the infected trees had trunk cankers.

6. Maintaining a certain foot of live stem standard on an area by means of pruning may be possible only within very broad limits.

7. The ribes population and distribution such as found on and around Kalispell Creek plots 24, 25 and 26 present special problems in both checking and eradication.

8. The establishment of ribes-free conditions is especially difficult on some areas such as Trail Creek plots 7 and 8.

9. The R. lacustre on two plots, one on the Clearwater operation and one on the St. Joe operation, have been reduced to those bushes six inches or less in height and with less than one foot of live stem in order to determine the survival and infecting power of dwarf bushes of this species.

10. Two new spread plots were established in 1942.

DEVELOPMENTAL WORK IN METHODS OF RIBES ERADICATION AND PROGRESS OF RIBES ECOLOGY WORK IN THE NORTHWESTERN REGION FOR 1942

By
V. D. Moss, Associate Forest Ecologist
and H. R. Offord, Pathologist

I. SUMMARY

A. Improvement in Methods of Ribes Eradication

1. Status of work. Field experiments have been completed for two eradication studies, namely: (a) "The interrelation between size of crew, width of crew strip and method of laying string line on ribes eradication," and (b) "A comparison between two methods of employing crews in a gang formation on ribes eradication." Special reports will be prepared on these two subjects upon completion of statistical analyses contemplated for the winter of 1942-1943.

(a) The study on size of crew, width of crew strip and method of laying string line incorporates the one, two and three-man crews working strip widths of 6, 12 and 24 feet per man with crews laying their own string line and with string line prestrung. The three-man crew working an approximate interval of 12 feet per man with string line prestrung resulted in the higher efficiency and the more reasonable costs. The efficiency of this crew formation was followed closely by the two-man crew working 12 feet per man, a good second choice. The one-man crew should never be used except for scouting out areas of light working conditions.

(b) The comparison between the two methods of employing crews in a gang formation, 4 three-man crews with crew leaders working in line and 3 four-man crews with crew leaders working behind three crewmen, proved the latter method to be more efficient in the elimination of light ribes populations and at comparable costs to the 4 three-man gang formation of crews. This increase in efficiency was accomplished by closer supervision of individual crewmen, by crew leaders directing the larger proportion of their searching time to ribes areas or sites on which ribes had been located by the crewmen, by searching systematically the entire crew strip for missed ribes, by keeping in mind the dozen or more common sites where ribes are most likely to be missed and by crew leaders approaching these sites from angles hitherto not traversed by the crewmen.

2. Future work. Eradication studies will be discontinued for the duration because of the complexity of the labor situation. Instead, close cooperation will be maintained with the control operations in working out field problems on the job in methods of ribes eradication. In addition, work has commenced on the preparation of an outline for a crew leaders' manual which will cover in a concise and illustrated manner all phases of the training program which are prerequisites to an efficient job of ribes elimination in light populations.

B. Effects of Grazing on Regeneration of Ribes and Western White Pine

1. Status of work. A series of four grazing studies have been established covering the subjects: (a) "Effects of grazing recent cutover lands on . . . . seedlings," (b) "Effects of deferred grazing on . . . . seedlings," (c) "Effects of controlled grazing on the germination, growth and development of ribes and western white pine seedlings" and (d) "Effects of continued seasonal grazing of old logged and burned-over lands on the regeneration of ribes and western white pine seedlings." Study areas are in most cases examined twice a season, before and after grazing by sheep. During each inspection the number of new seedlings, mortality of established bushes and many morphological studies on development of ribes and western white pine seedlings are recorded. Most of these grazing studies are being carried on in cooperation with the Forest Service, School of Forestry of the University of Idaho, and the Potlatch Timber Protective Association.

(a) The effects of grazing sheep on recent cutover lands have shown that the disturbance caused by trampling causes no significant increase of ribes populations from the occurrence of new seedlings, that many ribes under three years of age are destroyed by sheep, that many leaves and some live stem are removed each season, that no significant damage or loss results to white pine seedlings on slopes of less than 40 per cent under moderate rates of grazing and that, in many instances, the regeneration of white pine seedlings is appreciably favored by having sheep continually disturb the forest floor. Looseness of forest floor appears to encourage seed germination.

(b) The effect of deferring grazing from cutover lands which have been under range use by sheep has resulted in much ribes regeneration on the protected or ungrazed areas on the better sites. The reason for ribes seed germinating does not appear to be significantly associated with the disturbance resulting from moderate rates of grazing in the region. On the other hand, the number of western white pine seedlings germinating has been observed to be generally increased by the continued seasonal trampling of sheep over cutover lands that would otherwise tend to early development of a sod. Forest lands in this latter condition are not favorable to the germination or establishment of western white pine seedlings.

(c) The effects of controlling the intensity of grazing by sheep on cutover lands have shown that a state of overgrazing, a rate of 14 acres per animal unit, creates a condition encouraging to the germination of ribes seedlings. Much damage and loss of western white pine seedlings can also be expected on areas heavily grazed, regardless of topography. It has been found that when the intensity overruns the animal unit capacity of an area, grazing by sheep not only becomes detrimental to the sustained range yield but also is likely to produce a ribes problem and create a condition unfavorable for the establishment of a fully stocked stand of white pine reproduction.

(d) The effects of grazing sheep year after year on old logged and burned-over areas, that have become moderately sodded, appear to have little or no influence on stimulating ribes regeneration. Grazing of these old cutover lands may be found advantageous in creating a condition favorable for the regeneration of western white pine. The disturbance caused by trampling of sheep over these areas tends to keep the forest floor loose, a condition that is believed to favor the high germination and survival of white pine seedlings. Many of these old cutover lands are at present inadequately stocked with reproduction that originated following broadcast burning. A large number of these young trees are commencing to bear cones and throw seed as evidenced by the occurrence of many new seedlings over the areas. Nearly all the new pine seedlings observed are germinating on ground moderately disturbed by the trampling of sheep.

2. Future work. The establishment of new grazing subprojects in the near future is not contemplated. The present program will be maintained with all ribes being removed from the plot areas upon completion of five years' bush study. The plots will continue to be maintained thereafter and examined during the years of early succession and development of the forest stand originating on these cutover lands. One new grazing project not yet reported has been established in the Clearwater Forest by the School of Forestry, University of Idaho, in cooperation with the Clearwater Timber Protective Association. Ribes ecology studies will be initiated next season on this area in response to the request of the above agencies.

C. Ecological Studies of Ribes and Western White Pine Regeneration

1. Status of work. Numerous problems in ecology have confronted the methods project over the last five years on subjects relating to blister rust control measures, methods of slash disposal, stand improvement practices in immature stands and major harvest or improvement cuttings in mature stands of western white pine. Those that are currently reported on are: (a) "The effects of variable light and moisture conditions on the germination, growth and development of Ribes viscosissimum, R. lacustre and Pinus monticola," (b) "Resprouting habits of R. lacustre," (c) "Ribes regeneration key for the western white pine region," and (d) "Slash disposal measures and their effects upon ribes and western white pine regeneration."

(a) The study of variable light and moisture conditions on the germination, growth and development of ribes and western white pine seedlings was established under full sun, half shade and full shade light intensities. At each light station seed of ribes and pine were sown on natural duff, mineral and burned-mineral soil surfaces. Major results obtained after two seasons' study have shown that soil surfaces control the amount of seed germination as does the intensity of available light; establishment of germinated seeds is not appreciably affected by either soil surface or the intensity of light; morphological development of ribes is many-fold greater on burned-mineral than on mineral soil surfaces; mortality of ribes seedlings is greatest during the winter months; nearly all germination of new R. viscosissimum seed is complete by the end of the first season; peak of germination for new

R. lacustre seed is not reached until the second season; and white pine seedlings were found to be more tolerant to conditions of shade than either species of ribes.

(b) The asexual study of R. lacustre was undertaken to determine the size and portion of root capable of resprouting under variable conditions. Three treatments were employed: (1) roots cut leaving crown tissue attached, (2) roots cut about one inch below the crown and (3) roots cut six inches below crown. These treatments were established on both a north and south exposure during the spring, summer and fall seasons. A late fall inspection of the spring and summer treatments showed resprouting restricted to roots with crown tissue and with the higher per cent of roots resprouting on a south exposure. The final check for number of asexually developed bushes will not be made until the middle of next season to provide sufficient time for all resprouting to take place.

(c) A ribes regeneration key has been developed for this region to provide a satisfactory method of judging the potential ribes seedling contingency associated with areas being given protection. This is being accomplished by systematizing ecological knowledge which may either influence or indicate conditions suitable for ribes seedling survival. A key such as this which is largely based on vegetative associations can only be satisfactorily developed after much field sampling has been undertaken throughout the entire region. Extensive information secured during the past two seasons is now being used to reclassify and adjust original weights assigned to the various vegetative classes comprising the key.

(d) Studies of slash disposal measures in the western white pine type are being carried on in cooperation with the Forest Service, Potlatch Forests, Incorporated and the Slash Disposal Committee of the Inland Empire Section of the Society of American Foresters. One of the most promising methods developed is that of partial disposal. Logging slash is piled and burned along right of ways, along ridges, and occasionally a fire lane is built between ridges to break up the main body of slash into units of around five acres each. This method substantially reduces the hazardous fuel on an area, thus reducing the fire hazard to an acceptable standard, and prevents significant destruction of scattered seed trees. With this reduced burning of slash, few ribes seedlings have been found germinating on these areas in comparison with those on which all slash is piled and burned. Those that have become established are found around edges of burned slash piles and along skid trails. Pine seedlings, on the other hand, are germinating at random over the entire area without respect for soil surface. Ribes eradication work on such areas will be reduced to a minimum and restricted almost entirely to skid trails and burned slash piles. The leaving of white pine seed trees on these areas will assure adequate stocking of reproduction.

II. FIELD WORK

A. Improvement in Methods of Ribes Eradication

The Interrelation Between Size of Crew, Width of Crew Strip and Method of Laying String Line on Ribes Eradication

A preliminary report describing experimental procedures employed in the establishment of this study is given on pages 114 to 116 of the 1941 annual report. Below is an arithmetical summary presenting methods data for the St. Joe tests in table 1 and for the Clearwater tests in table 2.

TABLE 1

SUMMARY OF PLOT DATA FOR THE ONE, TWO AND THREE-MAN CREWS WORKING INTERVALS OF 6, 12 AND 24 FEET WIDE PER MAN WITH CREWS LAYING THEIR OWN STRING LINE AND WITH STRING LINE PRESTRUNG IN OPEN REPRODUCTION TYPE ON THE ST. JOE OPERATION

Size of Crew (No. Men)	Width of Crew Strip (Feet)	Average Ribes Per Acre			Man-Days Per Acre of Work Time	Per Cent Ribes Missed Per Acre
		Pulled	Missed 2 x ch.	Total		
Crews Laying Own String Lines						
1	6	85.14	15.70	100.84	1.477	15.6
	12	70.65	27.59	98.24	.927	28.1
	24	56.88	35.43	92.31	.485	38.4
2	12	71.70	28.86	100.56	1.330	28.7
	24	76.20	13.20	89.40	.959	14.8
	48	49.34	29.45	78.79	.839	37.4
3	18	67.60	13.30	80.90	1.077	16.4
	36	69.65	29.64	99.29	.873	30.0
	72	66.91	31.48	98.39	.736	32.0
String Lines Prestrung						
1	6	70.73	27.01	97.74	1.153	27.6
	12	79.23	19.21	98.44	.935	19.5
	24	56.80	32.68	89.48	.573	36.5
2	12	79.97	19.22	99.19	1.294	19.4
	24	82.46	16.74	99.20	1.021	16.9
	48	70.81	26.89	97.70	.886	27.5
3	18	82.14	15.17	97.31	1.286	15.6
	36	67.27	11.70	78.97	.745	14.8
	72	62.01	32.99	95.00	.701	34.7

Under the method of crews laying their own string line the one-man crew accomplished the higher standard of work on a 6-foot strip width. His efficiency decreased as the width of strip increased toward the maximum of 24 feet. The two-man crew obtained the higher efficiency on the 24-foot strip width, an interval of 12 feet per man. The three-man crew is observed to have accomplished the more efficient job on the 18-foot strip, an interval

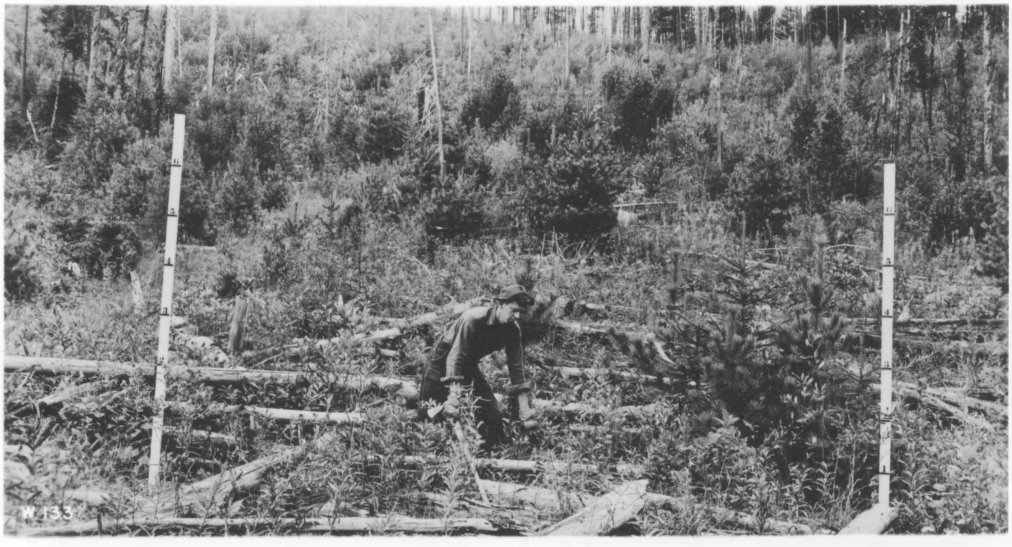
of 6 feet per man. During the progress of field work it was noted that with three men in this narrow 18-foot lane there was only room enough for two men to profitably work with the third man disposed in the job of laying string line and attempting to keep in formation. When the strip for the three-man crew was extended to a width of 36 and then 72 feet, the efficiency of their work noticeably declined. It is interesting to note, however, that the per cent of bushes missed on the 36-foot strip width was comparable to the per cent of bushes missed on the 72-foot strip.

Under the method of having string line prestrung, the one-man crew is observed to have done his more efficient work on the 12-foot strip. It is also noted that the higher standard of work by the two and three-man crews was accomplished on strips when each man covered an interval of 12 feet. The higher efficiency on ribes eradication with string line prestrung was accomplished when each crewman covered an interval of approximately 12 feet regardless of the size of the crew. Prestringing thus permitted each crewman to cover more ground area with higher efficiency and comparable costs to the method of crews laying their own string line. From this study it appears that the job of string laying should be independent of the job of ribes eradication to obtain the maximum standard of work.

Costs of both methods of string laying when expressed as the number of man-days expended per acre decreased as the width of strip increased for all sizes of crews studied. Costs of crew sizes between methods show no appreciable variation. On the expendable basis of one man-day per acre more was accomplished on the job of ribes eradication with string line prestrung for nearly all crew sizes working the three different crew strips. This study in methods of ribes eradication conducted in open reproduction type on the St. Joe Forest shows that higher efficiency and lower costs are obtained by employing the three-man crew working an approximate strip width of 36 feet, an interval of 12 feet per man with string line prestrung.

An interesting photo comparison between size of crews and width of crew strips is shown in plates I, II and III. Plate I shows the one-man crew working a 6-foot (W-132), 12-foot (W-133) and 24-foot (W-136) strip. Plate II shows the two-man crew working a 12-foot (W-134), 24-foot (W-139) and 48-foot (W-141) strip. Plate III shows the three-man crew working an 18-foot (W-135), 36-foot (W-140) and 72-foot (W-142) strip.

PLATE I



Between white markers is perspective of ground that a one-man crew must search in ribes eradication on strips 6-feet (W-132), 12-feet (W-133), and 24-feet (W-136) wide.

PLATE II

Between white markers is perspective of ground that a two-man crew must search in ribes eradication on strips 12-feet (W-134), 24-feet (W-139), and 48-feet (W-141) wide.

PLATE III

Between white markers is perspective of ground that a three-man crew must search in ribes eradication on strips 18-feet (W-135), 36-feet (W-140), and 72-feet (W-142) wide.

TABLE 2

SUMMARY OF PLOT DATA FOR THE ONE, TWO AND THREE-MAN CREWS WORKING INTERVALS OF 6, 12 AND 24 FEET WIDE PER MAN WITH CREWS LAYING THEIR OWN STRING LINE AND WITH STRING LINE PRESTRUNG IN CUTOVER TYPE ON THE CLEARWATER OPERATION

Size of Crew (No. Men)	Width of Crew Strip (Feet)	Average Ribes Per Acre			Man-Days Per Acre of Work Time	Per Cent Ribes Missed Per Acre
		Pulled	Missed 2 x ch.	Total		
Crews Laying Own String Lines						
1	6	39.25	59.78	99.03	.912	60.4
	12	37.18	61.61	98.79	.746	62.4
	24	42.36	57.10	99.46	.562	57.4
2	12	38.38	53.12	91.50	1.003	58.1
	24	33.27	46.01	79.28	.685	58.0
	48	39.13	28.67	67.80	.839	42.3
3	18	64.00	27.91	91.91	1.375	30.4
	36	47.18	53.81	100.99	.790	53.3
	72	37.71	62.97	100.68	.620	62.5
String Lines Prestrung						
1	6	39.89	58.90	98.79	.849	59.6
	12	56.25	43.32	99.57	1.003	43.5
	24	51.79	36.80	88.59	.788	41.5
2	12	45.17	46.49	91.66	1.179	50.7
	24	41.88	38.20	80.08	.791	47.7
	48	61.70	24.92	86.62	.836	28.8
3	18	55.66	37.47	93.13	.926	40.2
	36	54.45	30.22	84.67	1.016	35.7
	72	37.75	45.03	82.78	.712	54.4

This methods study undertaken on the Clearwater Forest was established in a fairly recent and heavy, partially cutover area having a preponderance of small ribes bushes. The effect of bush size on crew efficiency is well illustrated by comparing per cent ribes missed in tables 1 and 2. The St. Joe data in table 1 relates to older and larger bushes in open reproduction.

Under the method of having crews lay their own string line the efficiency of work is observed to have varied but slightly in table 2 between size of crews and width of crew strips. The one exception that can be pointed out is the work of the three-man crew on an 18-foot strip. The three-man crew laying its own string line on an 18-foot strip also performed more efficiently on the St. Joe tests than when working the 36 or 72-foot lanes. In this cutover type where visibility was fairly good in so far as laying string line was concerned it was not realized that the string ball man would be responsible for the lowering of efficiency as is shown in table 2. With string line prestrung on this cutover area much general improvement was obtained in the standard of work for nearly all sizes of crews and width of crew strips. Notable among these was the work of the two and three-man crews.

At present arithmetical variations shown in both tables 1 and 2 cannot be readily interpreted. These data must be subjected to an analysis of covariance before it can be determined what has been responsible for variance factors within and between methods, crews and strip widths. It can be generally stated, however, at this time that in performing ribes eradication work on cutover lands having many small ribes, string line should be prestrung if animals such as sheep or deer are not likely to tear them out before the crews have worked the area. The three-man crew should be used in preference to the two-man crew although the latter is a good second choice. The one-man crew should never be used except for scouting out areas. The higher efficiency will be obtained when each man covers an approximate interval of 12 feet. This strip or interval width can vary, however, from 10 to 16 feet without affecting the efficiency of the work. Proper width of crew strip should be regulated in accordance with density of ground cover, size of ribes bushes and somewhat by class of labor.

A Comparison Between Two Methods of Employing Crews in a Gang Formation on Ribes Eradication

This study was established on 35 acres of cutover land having a small ribes problem in the Clearwater Forest. During the past few years it has become necessary to employ crews in a gang formation in order to obtain adequate supervision of inexperienced labor. A general practice has been the use of 3 or 4 three-man crews in a gang formation under the supervision of an assistant camp boss. Crews used in this formation are composed of one crew leader and two crewmen for each crew unit. String lines are usually prestrung for this formation, although in light working conditions crews often lay their own string line. This formation was observed to be doing quite satisfactory work in medium to heavy ribes population but failed to function properly on areas of light to medium ribes populations. After carefully studying what might be considered the many faults associated with this method, a new formation was developed in an attempt to increase the efficiency of ribes eradication for second, third, etc. workings.

The new method or formation was composed of thirteen men just as in the old formation. This size of gang formation is well adapted to a 33-man camp because with a full camp there are enough men to fill two gangs, one being assigned to each assistant camp boss. In the new formation three crews composed entirely of crewmen were used with crew leaders placed behind to supervise and become mop-up men. Each crewman was assigned to what was considered the maximum width of interval without impairing the efficiency of the work. This was a width of 16 feet compared to a width of 12 feet by the old formation. Each formation, the old and the new, was covering an over-all width of 144 feet. In the old formation 12 men covered this area and in the new formation 9 men covered the area.

In justifying the new formation of placing the crew leaders behind their crews to supervise and become mop-up men the following advantages were anticipated: (1) Because original ribes patterns have been found to persist into second and third workings, crew leaders would be assisted by crews locating these ribes patches enabling them to concentrate searching primarily to areas known to have ribes. This was proposed because crewmen often fail to see or

to pull one ribes if three or four are present. (2) Supervision becomes more effective with the crew leader behind his men. Crewmen assume more responsibility since the crew leader has direct contact with individual standards of work, and they assume an individualistic attitude toward the job of ribes eradication since they are immediately responsible for the standard of work to the assistant camp boss who is right behind them. The latter is supervising and checking the work of all crews in the gang formation.

The results of these two comparative gang formation studies are shown in table 3.

TABLE 3

SUMMARY OF PLOT DATA FOR THE 4 THREE-MAN GANG FORMATION OF CREWS AND FOR THE 3 FOUR-MAN GANG FORMATION OF CREWS WORKING IN CUTOVER TYPE ON THE CLEARWATER OPERATION

Type of Crew Gang Formation	No. of Sub-blocks	Eradication Values Per Acre									
		Crews		Crew Leaders		Assistant Camp Boss		(1) Check		Total Ribes	Total Man-Days
		Ribes Pulled	Man-Days	Ribes Pulled	Man-Days	Ribes Pulled	Man-Days	No. Ribes	Feet Live Stem		
Four 3-Man Crews	14	61.27	.762			8.58	.068	31.95	36.21	101.80	.830
Three 4-Man Crews	15	54.19	.556	9.91	.195	3.00	.067	19.88	15.60	86.98	.818

(1) Values on 8 per cent actual field check calculated to 100 per cent.

The 4 three-man gang formation of crews pulled an average of 61.27 ribes per acre at a cost of .762 man-days. This represented a cost of 5.97 minutes of searching and pulling time chargeable against each ribes removed by the crews. Of the total number of ribes present the crews removed 60.19 per cent of the bushes. The 3 four-man gang formation of crews pulled an average of 54.19 ribes per acre at a cost of .556 man-days. This represented a cost of 4.92 minutes of searching and pulling time for each ribes removed. Crews under this formation accounted for 62.30 per cent of the total ribes on the area. Crew leaders behind the crews in the latter formation recovered an average of 9.91 ribes per acre at a cost of .195 man-days. Crews and crew leaders together obtained an average of 64.10 ribes per acre at a cost of .751 man-days. This raised the cost of each ribes removed from 4.92 minutes per bush to 5.62 minutes, but in the meantime the per cent of total ribes removed was raised from 62.30 per cent to 73.70 per cent at only a cost of .70 minutes per bush removed.

The assistant camp boss behind the 4 three-man gang of crews recovered 8.58 ribes per acre at a cost of .068 man-days. He was thus able to increase the efficiency of the eradication work by 8.43 per cent of the total ribes present. The assistant camp boss behind the 3 four-man gang formation of crews removed an average of 3.00 ribes per acre at a cost of .067 man-days. He was able to increase the efficiency of the eradication work by 3.45 per cent of the total ribes population present. In the end this new formation of crews left an average of 19.88 ribes with 15.60 feet of live stem at a cost of .818 man-days per acre. The 4 three-man gang formation of crews left an average of 31.95 ribes with 36.21 feet of live stem at a cost of .830 man-days per acre. The new formation of 4 three-man crews was thus able to accomplish a significantly higher standard of work at no increase in costs to the method of employing only the assistant camp boss back of the gang formation of crews. The differences in efficiencies between methods should be noticeably increased on working areas having less than 50 ribes bushes per acre. The efficiency of the new method increases as ribes populations become lighter, whereas, the reverse relation is usually true with the work of the old method.

B. Effects of Grazing on Ribes and Western White Pine Regeneration

Effects of Grazing Recent Cutover Lands on the Germination, Growth and Development of Ribes and Western White Pine Seedlings

Previous reports on this study have been made on page 138 of the 1939 annual report, pages 126 to 128 of the 1940 annual report and pages 126 to 131 of the 1941 annual report. Data presented in table 4 are summaries of five individual plots established to determine the effects of grazing sheep on recent cutover lands. Three of these plots are located in the Clearwater Forest and the remaining two on the St. Joe Forest.

TABLE 4

STATUS OF RIBES AND WHITE PINE SEEDLINGS IN 1942 AFTER FOUR YEARS' GRAZING ON PLOTS 1 AND 2 AND THREE YEARS' GRAZING ON PLOTS 3, 4 AND 5

Type of Plot	Status of Plant	Number Pine by Year of Origin						Number Ribes by Year of Origin					
		1938	1939	1940	1941	1942	Total	1938	1939	1940	1941	1942	Total
Plot 1 - Clearwater Forest													
Exclosure (Ungrazed)	Alive	127	94	28	5	5	259	32	30	9	1	0	72
	Dead	10	11	1	0	1	23	3	8	1	1	0	13
Control (Grazed)	Alive	109	79	20	2	4	214	54	30	4	0	0	88
	Dead	19	16	1	1	1	38	5	1	0	0	0	6
Plot 2 - Clearwater Forest													
Exclosure (Ungrazed)	Alive	32	29	4	0	4	69	23	11	1	2	0	37
	Dead	2	6	0	2	0	10	7	2	0	0	0	9
Control (Grazed)	Alive	24	31	9	2	8	74	12	0	0	0	0	12
	Dead	5	4	2	3	0	14	1	0	0	0	0	1
Plot 3 - Clearwater Forest													
Exclosure (Ungrazed)	Alive	378	340	30	6	12	766	35	42	4	4	0	85
	Dead	55	69	14	3	0	141	2	6	0	0	0	8
Control (Grazed)	Alive	273	68	16	5	10	372	139	31	4	4	0	178
	Dead	58	20	5	3	0	86	11	7	0	1	0	19
Plot 4 - St. Joe National Forest													
Exclosure (Ungrazed)	Alive	4	5	2	1	1	13	181	96	21	7	5	310
	Dead	1	0	0	0	1	2	7	3	1	1	1	13
Control (Grazed)	Alive	4	4	1	2	1	12	123	63	10	3	4	203
	Dead	1	0	0	0	0	1	62	37	9	11	3	122
Plot 5 - St. Joe National Forest													
Exclosure (Ungrazed)	Alive	6	8	1	3	15	33	36	14	3	1	1	55
	Dead	0	2	0	0	1	3	1	1	0	0	0	2
Control (Grazed)	Alive	7	12	4	3	13	39	74	13	1	0	1	89
	Dead	1	2	0	0	0	3	26	11	1	0	0	38

Plot 1, located on an east exposure, has shown no significant difference in the amount of germination and seedling survival of ribes and white pine between the ungrazed and grazed areas of the plot. Plot 2 on a west exposure has shown a tendency for ribes to continue germination on the ungrazed portion of the plot long after germination had ceased on the grazed area. It is difficult this early in the study to determine whether grazing has or has not been largely responsible for the continued germination of ribes seed. Since the year 1940, germination of pine seed appears to have been slightly favored on area being grazed. Plot 3, which represents a condition of general exposure, has not shown any material difference in germination of ribes and white pine seedlings between the ungrazed and grazed portions of the plot.

In the St. Joe Forest, on plots 4 and 5, germination of ribes and white pine seedlings has been very comparable on both the grazed and ungrazed portions of the plots. There has been, however, a noticeable loss of ribes seedlings

from the action of trampling and browsing by sheep on plot 4. Nearly all this loss has occurred when ribes were less than four years of age. Of the 325 ribes germinating on the plot, 122 or about 38 per cent has been eliminated by the action of sheep. No loss of white pine seedlings from sheep has occurred on either of the two plot areas grazed.

Effects of Deferred Grazing on the Germination, Growth and Development of Ribes and Western White Pine Seedlings

Previous reports on this study have been made on pages 128 to 129 of the 1940 annual report and on pages 133 to 135 of the 1941 annual report. Data presented in table 5 are summaries for plot 6 located on a northern aspect and for plot 7 located on a southern exposure in the Clearwater Forest. Cutover lands representing these studies were grazed for a period of about five years before the exclosures were established. The problem in question is whether or not adequate control standards of eradication work can best be obtained with or without sheep on these areas.

TABLE 5

STATUS OF RIBES AND WHITE PINE SEEDLINGS AFTER THREE YEARS' MIDSUMMER GRAZING ON CUTOVER LANDS IN THE CLEARWATER FOREST (PLOT 6, NORTH EXPOSURE; PLOT 7, SOUTH EXPOSURE)

Type of Plot	Status of Plant	Number Pine by Year of Origin						Number Ribes by Year of Origin					
		1935-1938	1939	1940	1941	1942	Total	1935-1938	1939	1940	1941	1942	Total
Plot 6 - Clearwater Forest													
Exclosure (Ungrazed)	Alive	106	40	26	18	2	192	23	17	24	19	2	85
	Dead	74	4	8	4	0	90	8	9	6	3	0	26
Control (Grazed)	Alive	154	26	36	28	11	255	25	7	2	4	0	38
	Dead	44	4	3	11	0	62	3	2	1	1	0	7
Plot 7 - Clearwater Forest													
Exclosure (Ungrazed)	Alive	371	76	30	13	4	494	31	6	2	4	0	43
	Dead	71	12	8	5	0	96	8	2	0	0	0	10
Control (Grazed)	Alive	365	46	23	20	9	563	27	5	4	3	0	39
	Dead	64	11	12	10	0	97	9	1	2	0	0	12

On plot 6 ribes germination has been more pronounced on the ungrazed area and pine germination more pronounced on the area permitted to be grazed. No appreciable difference has been found in the germination of ribes and pine seed on plot 7 between the ungrazed and grazed portions of the plot. It will be necessary for these studies to continue over quite a period of time before definite trends in ribes and pine seed germination can be specifically determined. The results of these studies so far indicate, however, that the germination of ribes seed does not appear to be associated with the disturbance caused by the trampling of sheep over cutover lands. Any disturbance such as that caused by sheep which takes place on areas year after year will probably be found favorable to the germination of white pine seed and at least nonencouraging to the germination of ribes seed. From the time

exclosures of plots 6 and 7 were established, pine seedlings have been appearing in greater numbers on the grazed than on the ungrazed or protected areas.

Vegetative densities, plant heights and many other morphological studies are being made of all plants associated with and including ribes and pine on these plots. This is being done because it has been the general belief of many that sheeping was responsible for large numbers of dwarfed ribes bushes on grazed cutover lands. These studies have shown, so far, that the amount of live stem produced and the height of bush is governed by exposure, favorableness of growing season and by the type or composition of soil on which the plant is growing. Grazing has been found to have little or no effect upon the morphological development of ribes bushes except in cases of severe overgrazing. Keeping sheep off an area will not necessarily improve the visibility for ribes because they will shortly become screened by the response of the major forage population. Ribes are only a poor secondary browse plant under normal rates of grazing, consequently any deferment of sheep from these cutover lands will stimulate more the development of the palatable group than the unpalatable class of plants. No advantage is seen for the deferment of grazing in establishing blister rust control measures to these cutover lands. Control work should, however, always be done in advance of each season's grazing on an area to avoid the possibility of having to look for partially defoliated ribes.

Effects of Controlled Grazing on the Germination, Growth and Development of Ribes and Western White Pine Seedlings

Previous reports have been made on this study on pages 128 to 129 of the 1940 annual report and on pages 131 to 133 of the 1941 annual report. This study is being carried on in cooperation with the School of Forestry, University of Idaho and the Clearwater Timber Protective Association. The Bureau has agreed to follow the ecological history of ribes regeneration on the areas under observation. The results of four years' study are shown in table 6. Fifty head of sheep were grazed on section A for three days and on section C for two days. This is at the rate of 14 acres per animal unit for section A and 21 acres per animal unit for section C. Section B remains ungrazed.

TABLE 6

STATUS OF RIBES SEEDLINGS IN 1942 AFTER FOUR YEARS OF CONTROLLED GRAZING ON CUTOVER LANDS IN THE CLEARWATER FOREST

Type of Plot	Status of Bush	Number of Ribes by Year of Origin					
		1935-1938	1939	1940	1941	1942	Total
Section A	Alive	8	3	0	0	0	11
Grazed 3 days	Dead	6	1	0	0	0	7
Section B	Alive	11	0	0	0	0	11
Ungrazed	Dead	2	0	0	0	0	2
Section C	Alive	14	0	1	0	0	15
Grazed 2 days	Dead	1	0	0	0	0	1

Section A and also section C have shown but slight ribes regeneration response to the different intensities of grazing. The origination of these new seedlings may or may not have been caused by the disturbance of sheeping. Four new ribes originated on section A the same year the enclosure was established. The one new bush on section C came in the second season. Since 1940 no additional ribes regeneration has taken place on either of the two grazed areas. The ecological history of ribes regeneration on these plots will be followed over a number of years in order to accurately determine what effects different degrees of grazing have on the occurrence and development of ribes.

Morphological development studies of ribes on these plots have shown considerable differences between bushes grazed and ungrazed. On section A (grazed three days) the average ribes height was found to be 1.05 feet; average feet of live stem, 3.02 feet; number of leaves before grazing, 30.09; and number of leaves following grazing, 23.64. The sheep removed or browsed 21.4 per cent of the total leaves present. On section C (grazed two days) the average ribes height was observed to be 1.10 feet; average footage of live stem, 3.87 feet; number of leaves before grazing, 29.93; and number of bushes after grazing, 24.67; the sheep having removed only 17.6 per cent of the total number of leaves present. On section B, the ungrazed portion of the plot, the average height of ribes was found to be 1.34 feet; average feet of live stem, 6.81; and number of leaves per bush, 67.27. On this latter section, feet of live stem and number of leaves were about double those per bush on the grazed sections. Heights of bushes in all three sections are about the same. The intensities of grazing have had little influence so far in the development of ribes, although ribes on the more heavily grazed area show a slight decrease in heights, feet of live stem and total number of leaves. Ribes on the ungrazed section must be considered more hazardous because of the larger blister rust target made by the more abundant crop of leaves. As far as finding ribes on these three sections, those on the grazed sections are most visible. Ribes on the ungrazed section are badly screened by the more prolific growth of plants such as ferns, thimbleberry, huckleberry, grasses and various annuals and biennials that are responding most from the nonuse of range land.

Effects of Continued Seasonal Grazing of Old Logged and Burned-Over Lands on the Regeneration of Ribes and Western White Pine Seedlings

Early logging practices on much of the St. Joe Forest represented conditions of clear-cutting all merchantable white pine trees and disposing of slash by broadcast burning. This practice fairly gutted large acreages that didn't appear to have a chance of becoming restocked with any forest species let alone white pine. In most instances, there was no source of white pine seed within miles of some of these areas. Through some twenty to thirty years, however, white pine reproduction has become miraculously established until today many of these areas are approaching a condition of satisfactory stocking. Holes still remaining in the stands are gradually becoming filled with reproduction originating from seed produced by trees fifteen to twenty-five years old. These became established shortly after the fires. Nearly all these areas have been continually grazed since the first year or so following

the heavy burning of these cutover lands. Medium to heavy populations of ribes were encountered on most of these areas in the initial application of control measures. Most of these bushes had produced fruit for years up until their removal so that much new seed is in the ground. The question that has always been in the minds of those responsible for the protection of these areas is just what effects this continual grazing has on the regeneration of ribes and white pine seedlings.

In order to answer this question, three grazing exclosures were established in 1940 on the Marble Creek drainage in the St. Joe Forest. Each exclosure has an equal area of grazed ground which is used as the control unit. All ribes bushes established prior to the construction of the exclosures have been removed. All pine and other coniferous species of trees have been recorded and plotted on maps for ecological study of succession. Since 1940 these plots have been examined each season for new ribes and white pine seedlings. Over this three-year period no new ribes have been found. New pine seedlings are, however, commencing to appear quite generally over both the ungrazed and grazed portions of these studies. These new seedlings are originating from seed produced by reproduction just commencing to bear cones. Since the exclosures have been exposed to many years of grazing before the establishment of these plots, it will probably be from three to five years yet before the grazing scars heal, enabling a comparison to be made of pine regeneration between grazed and ungrazed portions of this study. Major palatable plants within the exclosures are just commencing to respond to protection from grazing. These studies will be followed each year over a long period of time in order to obtain the ecological history of ribes required for effective control work on these areas and information on the regeneration of white pine essential to the development of satisfactory forest management plans by the Forest Service.

C. Ecology Studies of Ribes and Western White Pine Regeneration

The Effects of Variable Light and Moisture Conditions on the Germination, Growth and Development of R. viscosissimum, R. lacustre and P. monticola

Previous reports on this study are shown on pages 122 to 126 of the 1940 annual report and on pages 119 to 126 of the 1941 annual report. This study was established to specifically determine the conditions affecting germination, survival and growth of the two major species of ribes found in this region and of western white pine under full sun, half shade and full shade light intensities. At each light station seed was sown on natural duff, mineral and burned-mineral soil surfaces. During the first year plots were inspected at ten-day intervals throughout the season. During the second season plots were examined at approximate monthly intervals. The total number of ribes and white pine seed germinating during each of the seasons, 1941 and 1942, are shown in table 7.

TABLE 7

OCCURRENCE OF RIBES AND WHITE PINE SEEDLINGS FOR THE YEARS 1941 AND 1942 OF 16,000 RIBES AND 2,000 SEEDS OF PINE SOWN ON DUFF, MINERAL AND BURNED-MINERAL SOIL SURFACES UNDER FULL SUN, HALF SHADE AND FULL SHADE LIGHT CONDITIONS

Year of Germination	Duff Surface			Mineral Surface			Burned-Mineral Surface		
	R. lac.	R. vis.	P. mont.	R. lac.	R. vis.	P. mont.	R. lac.	R. vis.	P. mont.
Full Sun Light Station									
1941	15	16	20	3,184	1,322	883	1,966	740	314
1942	674	2	6	2,134	7	14	5,967	13	1
Total	689	18	26	5,318	1,329	897	7,933	753	315
Half Shade Light Station									
1941	42	54	49	2,725	1,092	1,170	2,650	1,556	1,200
1942	1,348	1	90	6,078	11	29	8,493	19	39
Total	1,390	55	139	8,803	1,103	1,199	11,143	1,575	1,239
Full Shade Light Station									
1941	771	288	841	1,937	1,083	1,434	2,233	1,554	1,379
1942	5,968	0	212	6,191	0	44	6,326	0	49
Total	6,739	288	1,053	8,128	1,083	1,478	8,559	1,554	1,428

In the above table the actual number of seeds germinating during the years 1941 and 1942 is shown by species on the three soil surfaces under the different intensities of light. A total of 16,000 ribes seed and 2,000 pine seed was sown on each of the soil surfaces at the three light stations. Of the total number of R. lacustre seed germinating at the full sun station about 98 per cent on duff, 40 per cent on mineral and 75 per cent on burned-mineral surfaces took place the second season. The bulk of R. viscosissimum and white pine seed germinated the first season. The burned-mineral surface was the most favorable medium for the germination of R. lacustre seed and the mineral surface for R. viscosissimum and white pine seed.

Of the total number of R. lacustre seed germinating in two seasons at the half shade station about 97 per cent germinated on duff, 69 per cent on mineral and 76 per cent on burned-mineral soil surfaces during the second season. Of the total number of R. lacustre seed germinating at this station the larger number occurred on the burned-mineral surface followed in order by mineral and duff. With the exception of pine seed on duff surface, the bulk of R. viscosissimum and pine seed germinated during the first season. The total number of R. viscosissimum and pine seed germinating on the three soil surfaces under the three intensities of light has been generally heavier under conditions of full shade. Increased soil moisture and reduced soil temperature have been factors primarily responsible for increased germination of seed toward conditions of full shade.

Of the total number of R. lacustre seed germinating by soil surfaces in two seasons at the full shade station about 89 per cent germinated on duff, 76 per cent on mineral and 74 per cent on burned-mineral soil surfaces during the second season. The larger number of R. lacustre seed germinating at this station occurred on the burned-mineral surface as was the case at the half shade and full sun stations. It is interesting to note that no germination of R. viscosissimum seed took place during the second season at this station. Of the total number of all seeds germinating, the increase has been from full sun toward conditions of increased moisture and a lowering of soil temperatures that prevail at the part and full shade stations.

From the results shown in table 7 of germination on duff, mineral and burned-mineral soil surfaces under full sun, half shade and full shade conditions, the following conclusions can be reasonably drawn after two years' study: (1) The peak of germination for fresh sown seed of R. lacustre occurs the second season; that for R. viscosissimum, the first season. (2) The peak of germination for western white pine seed occurs, with possibly the rare exception of good storage conditions, the first season. (3) The number of all seeds germinating for both ribes and white pine increases generally toward conditions of increasing soil moisture and a lowering of soil temperature under reduced light intensities.

The question is often asked, "How many of the ribes seed germinating become established as seedlings under the various forest conditions?" This can be answered, in part, from the results shown in table 8.

TABLE 8

TOTAL NUMBER OF RIBES AND WHITE PINE SEED GERMINATING THE FIRST SEASON AND PER CENT OF THESE SEEDLINGS SURVIVING OCTOBER, 1941, JUNE, 1942, AND OCTOBER, 1942

No. Seedlings Germinating First Season and No. Surviving by Dates	Duff Surface			Mineral Surface			Burned-Mineral Surface		
	R. lac.	R. vis.	P. mont.	R. lac.	R. vis.	P. mont.	R. lac.	R. vis.	P. mont.
Full Sun Light Station									
No. Seeds Germinated	15	16	20	3,184	1,322	883	1,966	740	314
% Survival - Oct. 1941	60.0	81.2	70.0	77.8	82.3	63.8	59.2	86.6	65.9
% Survival - June 1942	53.3	68.7	70.0	66.4	43.3	63.2	46.6	69.6	65.3
% Survival - Oct. 1942	53.3	68.7	70.0	66.2	43.0	62.7	45.6	69.1	65.3
Half Shade Light Station									
No. Seeds Germinated	42	54	49	2,725	1,092	1,170	2,650	1,556	1,200
% Survival - Oct. 1941	76.2	81.5	75.5	97.2	92.4	93.9	95.0	92.0	85.0
% Survival - June 1942	52.4	16.7	69.4	81.5	44.1	90.9	70.5	56.3	78.2
% Survival - Oct. 1942	52.4	14.8	69.4	81.3	43.3	90.8	70.0	55.7	77.9
Full Shade Light Station									
No. Seeds Germinated	771	288	841	1,937	1,083	1,434	2,233	1,554	1,379
% Survival - Oct. 1941	89.1	85.8	79.2	89.5	84.9	82.2	95.8	88.4	77.9
% Survival - June 1942	52.4	7.6	75.4	40.4	7.4	79.8	17.5	0	74.0
% Survival - Oct. 1942	47.6	5.9	74.6	40.0	5.5	79.6	17.3	0	73.8

The subheading, "Number Seeds Germinated," is the actual number of first-year ribes and white pine seedlings recorded the first season. The per cent survival of these germinated seedlings is shown as of October, 1941, June, 1942, and October, 1942. Survival of seedlings that germinated the second season is not considered in this table. Causes of seedling mortality from date of seed germination to October, 1941, were classified as losses from physical, insect, damping-off fungi, heat and drought. Cause of mortality from October, 1941, to June, 1942, was classified as winter kill. Causes of mortality from June, 1942, to October, 1942, were the same as shown for the dates corresponding to period between seed germination and October, 1941.

At the full sun station the per cent survival of R. lacustre seedlings was generally lower than for R. viscosissimum. Mortality from winter kill was heavy for ribes; there was little change in the status of pine during this period. At the half shade and full shade stations mortality of R. viscosissimum seedlings was extremely heavy, especially during the winter months. Damping-off fungi appeared to be largely responsible for heavy mortality of seedlings during the winter months. Winter kill of ribes is observed to generally increase toward lowering light intensities, a condition which causes reduced vigor of ribes. The percentage of white pine seedlings surviving over a period of two growing seasons appears to be little influenced by either the intensity of light or the type of soil surface. The difference in tolerance to shade is clearly shown in table 8, by differences in the per cent of R. lacustre and R. viscosissimum seedlings surviving at the three stations; R. lacustre is far more tolerant than R. viscosissimum but less tolerant to shade during the first two growing seasons than white pine.

TABLE 9

pH MEASUREMENTS OF SOIL SAMPLES TAKEN FROM LIGHT-MOISTURE PLOTS, LIGHT CONDITIONS AND SOIL SURFACES AS SHOWN

Soil Zone	pH of Soil Sample								
	Duff Surface			Mineral Surface			Burned Mineral Surface		
	1940	1941	1942	1940	1941	1942	1940	1941	1942
Full Sun Station									
Surface	5.04	5.33	5.30	5.99	6.18	6.10	7.49	7.16	7.29
6-inch	5.57	5.84	5.71	5.67	6.01	5.97	5.59	6.26	5.90
12-inch	5.79	5.75	6.10	5.92	5.92	5.89	6.62	6.18	6.18
Half Shade Station									
Surface	5.29	5.27	5.09	5.79	5.84	6.18	7.22	6.95	6.60
6-inch	6.01	6.35	6.31	5.97	6.26	6.10	6.05	6.24	6.18
12-inch	5.90	6.01	6.01	5.72	5.93	5.84	5.92	5.96	5.90
Full Shade Station									
Surface	5.36	5.17	5.58	6.01	6.01	6.18	7.20	7.20	7.28
6-inch	5.92	5.90	5.75	5.88	6.01	5.84	5.58	5.82	6.18
12-inch	5.90	5.67	5.84	5.63	5.67	6.01	5.92	5.84	5.88

Hydrogen-ion determinations are shown for the three light stations by type and depth of soil surface in table 9. The three soil zones for the duff plots at the three light stations have shown but slight pH variations over three years' study. The removal of duff off mineral soil has slightly reduced the acidity of the latter. Alkalinity of burned-mineral surface soils has been reduced by leaching over the past three years. Less change in hydrogen-ion concentration has taken place under conditions of full shade where moisture and temperature remain fairly constant.

Resprouting Habits of R. lacustre

This study was undertaken to determine the size and portion of R. lacustre roots capable of asexual development. The problem also involved the effects of exposure and season of year on potential resprouting habits of this species. Three root treatments were employed, namely: (1) Roots were severed at the crown leaving a portion of crown tissue attached to the root. (2) Roots were cut about one-half to one inch below the crown, not paying any attention to whether crown tissue was present or not. (3) Roots were severed at least six inches below the crown to be sure no crown tissue was present. The first treatment was employed to encourage resprouting; the second treatment was used to make resprouting questionable, and the third treatment was employed to insure no resprouting and illustrate to the field operations the size and portion of R. lacustre root that can be left without asexual comeback of bushes. These three treatments were established on a north and south exposure during the spring, summer and fall growing seasons. The site selected for this study is located on Scaler Creek in the St. Joe National Forest.

Ribes selected for study of resprouting habits on the Scaler Creek drainage were from four to six years of age. A forester's pruning shear and a pair of small hand shears were the implements used in cutting the roots. Ribes on the north exposure had long, trailing, and few stems; large, thin, and few leaves; and roots somewhat shallow in comparison to those on the south exposure. Those on the south exposure had rather short, stout, and many stems; somewhat small, thick, and many leaves; and deep, penetrating roots. Ribes on both exposures were under some shade since the area was partially logged.

Final results of these treatments will not be available until the latter part of the 1943 season. This delay is necessary because of the fall treatment of roots and to provide sufficient time for delayed resprouting of all treatments. An inspection was made, however, of the spring and summer series during the past fall season. The general trends found during this inspection were as follows: (1) Asexual development or resprouting was restricted entirely to roots with crown tissue. (2) Resprouting of roots with crown tissue was much greater in number of total roots treated on the south exposure. (3) Resprouting of roots with crown tissue was much greater for the summer than for the spring-treated series. That resprouting would be restricted to roots with crown tissue seemed apparent from field observation before the present study was established. The fact that the greater number of roots with crown tissue resprouted on the south exposure and for the summer treated series may seem contrary to previous experience of most blister rust personnel.

The explanation for the greater amount of resprouting on the south exposure appears to be a longer and a much earlier growing season for the production of reserve food. Also, with the greater intensity of light more food can be manufactured, say in an hour, than could be produced by bushes on a north slope under lower light intensities. High soil temperatures, depth of root penetration, sturdy roots and plant associations are other factors that might be instrumental in conditioning greater resprouting. As previously mentioned, bushes on the north exposure have large, thin, and few leaves in comparison to those growing on south exposures. These facts lead one to believe that such bushes are not capable of manufacturing large reserves of food for storage which is apparently one of the prime prerequisites along with moisture for asexual development. With more roots having crown tissue resprouting from the summer series than from the spring-treated series it appears that this difference was caused primarily by the longer growing season for the manufacturing of food by bushes allowed to grow until midseason. Other factors, such as higher soil temperatures in midseason are also important.

The results of these studies, although not complete, show significant trends which will aid at this time in the formulation of satisfactory control methods for R. lacustre. The following points are suggested: (1) Since resprouting is restricted to roots with crown tissue, all roots should be removed at least six inches in all directions from the root crown. (2) All aerial plant parts such as layering stem, buried stem, stolons, small pieces of broken stem, etc., should be removed from the ground and placed on some object to dry. (3) Early season eradication of R. lacustre when conditions favor ease of removing bushes and ribes are less liable to sprout will result in a more satisfactory job of eliminating roots capable of resprouting. (4) Closer supervision of workmen should be provided in the job of removing R. lacustre roots on southern exposures. It is on such sites where the greater amount of resprouting from roots with crown tissue will take place.

Ribes Regeneration Key for the Western White Pine Region

This key was formulated in 1941 from a basic ecology weight-rating plan instituted in the California region. Its purpose is to develop an ultimate method of judging the potential ribes seedling contingency on areas being given protection by systematizing all ecological knowledge which may influence or indicate conditions for ribes seedling survival. This key will serve two important purposes: (1) It will provide a form on which the seedling contingency can be worked out for any given area by those personnel considered as nonspecialist in ecology, and more important, (2) It will bring together in the minds of all personnel the many ecological factors and their respective importance which influence or indicate conditions for ribes seedling survival. It is hoped that this deductive reasoning from general ecological facts to the particular ribes seedling contingency of areas can become an everyday habit with permanent personnel without the use of the key form.

The basic key originally developed for the white pine region has undergone many revisions in the last two years. These are necessary in order to develop a basic plan serviceable throughout the region in all the eradication

types. This requires much type sampling on each of the operations to determine the ribes contingency associated with and influenced by factors herewith classed as ecology. The present key carries a factor rating of 200 points divided among seven classes. These classes and their respective ratings are: plant association (30), maturity of vegetation (40), density of vegetation (30), type of disturbance (40), age of disturbance (20), exposure (10), and ribes population removed (30). Numerical weights for plant association, maturity of vegetation and density of vegetation are divided equally within classes between timber and brush. Type of disturbance is divided into eradication, sheep, fire and logging. The importance and weights of these types of disturbances increase from eradication to logging. Age of disturbance throws the bulk of weight below ten years, a full 20 points being given for the ages one to three. Exposure gives north 10 points; east, 8; level topography, 6; west, 4; and south, 1.

The class, ribes population removed, has been the most difficult factor to orient, because oftentimes the ribes population taken off an area is not truly a criterion of the number of new seedlings likely to come back. In other words, an area on which 500 ribes have been removed per acre may not have a greater seedling problem than one from which only 50 ribes have been removed per acre. Successional history of ribes and potency of seed after many years storage are undoubtedly factors responsible for some of these variations. Since ribes regeneration from new seedlings in this region is not significantly important except on recent cutover lands, the assignment of weights within the class is being accomplished on a broad basis. Weights have thus been accordingly assigned as follows: 1 to 100 ribes per acre, 1-10; 101 to 500 ribes per acre, 11-20; and 500+ ribes per acre, 21-30 points. The only ribes considered in this class are those removed by first working.

The key as revised and used toward the end of the 1942 field season is proving quite satisfactory in determining the potential ribes seedling problem on areas throughout the region. The key will always have a large standard error of estimate in the determination of the exact number of ribes seedlings originating on an area after eradication. The key will be found, however, very accurate in determining the likelihood of conditions for seedling survival on an area. This is, of course, a more important point than knowing how many ribes seed are going to germinate. Further work is planned in testing the application of this key to various eradication types in the region before sufficient information can be secured for completion of the method.

Slash Disposal Measures and Their Effects Upon Ribes and Western White Pine Regeneration

Slash disposal measures in the western white pine type have not been entirely satisfactory in the past. For one thing, costs have been considered high. In addition, loss of many valuable residual trees near burned slash piles has resulted in reducing volume for next cutting and number of seed trees for the source of natural regeneration. Thus, white pine stocking is often inadequate and ribes regeneration on these areas is usually quite heavy

because of burning. In 1939, the Forest Service, State Forester of Idaho, School of Forestry of the University of Idaho, Potlatch Forests, Incorporated, and the Bureau of Entomology and Plant Quarantine worked with a slash disposal committee sanctioned by the Inland Empire Section of the Society of American Foresters in planning and establishing experimental studies on new slash disposal measures for the region. The Potlatch Forests, Incorporated, undertook the field studies on the Clearwater and St. Joe Forests. The Bureau was asked to study the ecological history of ribes regeneration along with white pine reproduction.

The general method of slash disposal proposed by the committee, and instituted in the field by Potlatch Forests, was the piling and burning of slash along right of ways, along ridges, and from one ridge to another, in order to break up the body of slash into small units of about five acres each. In other words, fire lanes or breaks were made between one to two chains wide along hazardous spots throughout the area, so that no body of slash was much over five acres in extent. If fire ever got started on the area it was reasoned that the many fire lanes would afford an opportunity to combat the fire without much difficulty, since the fire lanes were carefully cleaned of all flash fuel. Slash that remained in the small five-acre units was broken up quite finely since caterpillars were used to log the areas. It is expected that this fine slash will decompose rapidly in comparison to bulky slash left after horse logging. Rapid decomposition of this fine, pulverized slash should materially reduce the period of high fire hazard by a number of years on such areas.

An inspection of two slash-treated areas in the Clearwater Forest last season showed some interesting facts. It has been two years now since these areas were logged. Information on the regeneration of ribes and pine seedlings was obtained by running a 20 per cent check, a check strip 13.2 feet wide at intervals of one chain over the area. The occurrence of ribes seedlings on these areas has been less than five per acre. These few have been found around the edges of burned slash piles and along main skid trails. None have been found on the small areas still containing slash. These few ribes per acre present an entirely different picture than was found on an adjacent area on which all slash was piled and burned. On the latter area ribes seedlings were appearing in numbers of about 80 bushes per acre and scattered generally throughout the area.

The regeneration of pine seedlings on the experimental areas of slash disposal is numbering better than 500 per acre. These are scattered generally over the entire area, thus assuring satisfactory stocking. Of particular interest is the fact that these pine seedlings are germinating as well in the slash areas as in the fire lanes. The germination of pine seedlings on the adjacent area, where all slash was piled and burned, has been at the rate of less than 100 per acre. One of the main reasons why there are not more is because so many seed trees were damaged or destroyed by fire resulting from large-scale slash disposal.

Studies of the new method of limited or partial slash disposal have shown thus far the encouraging results as follows: (1) cheaper costs of slash disposal, (2) negligible loss of residual volume or seed trees with careful piling and burning methods employed, (3) good fire protection and suppressional measures established on the areas (4) few ribes seedlings germinating (searching for these few ribes can be restricted almost entirely to skid trails and fire lanes) and (5) excellent regeneration of white pine seedlings scattered generally over the entire area, thus assuring good stocking.

III. LABORATORY AND GREENHOUSE WORK

Laboratory and greenhouse studies relating to the improvement of control methods were in progress at Berkeley throughout the calendar year of 1942. Greenhouse facilities for our work are now provided at the Albany Gill Tract of the University of California. Early in November, 1941, all equipment and plant material were moved from greenhouse No. 6 on the campus to the Gill Tract. These new quarters provide many improved facilities, though the present curtailment of auto travel makes the new greenhouse location more inconvenient than was anticipated. Also, continuous care of the greenhouse has had to be provided by the permanent Berkeley staff since January, 1942, when cessation of the WPA project deprived us of a greenhouse assistant. The following summary gives the scope and objectives of the more important laboratory and greenhouse assignments for 1942.

Soils Work

The development of the ribes regeneration key in California and Idaho emphasized the need for more data on soils, especially in California, where considerable variations in soil types occur. Twenty-eight California soil samples collected in 1938 were tested for moisture equivalent (by high-speed centrifuge) and permanent wilting percentage (by standard sunflower test). Data for available water were calculated but these figures must be considered as approximations because the soil density was not measured in the field at the time the soil samples were taken. A smaller number of soils, representing in a rather broad way the range or variations in soil types, with which we are commonly concerned, were analyzed for total nitrogen and organic carbon. The carbon-nitrogen ratio provides an approximation of what has been termed the "fertility level" of the soil. A new and what may be a convenient technique for determining wilting point percentage was tested for several of the soils already checked by the sunflower method. The principle of the new method is to allow tared dishes containing the soil samples to come to equilibrium with a saturated solution of barium nitrate in a desiccator, the whole system being maintained at reasonably constant room temperature. The method lends itself to testing of large numbers of soil samples and requires little or no attention once the samples have been set away. Further tests of California and Idaho soils are planned with this new method.

Correlations of the above physico-chemical soils data with germination tests and growth tests of ribes, and with data on the ribes populations and general site index previously obtained at the time of collecting the soil samples, showed that the soils having the lowest amounts of available water and the lowest "fertility level" were the poorest ribes sites.

Soils work will be continued during the winter of 1942-43 with the examination of samples collected in California during the 1942 survey. Useful soils data have been obtained in Idaho from the Kaniksu light-moisture plots. pH measurements in duplicate have now been made annually for the past three years on 27 soil samples from the Kaniksu plots. Top to root ratio and pictorial records of root development taken from these Kaniksu plots show differences occasioned by soil surface condition (i.e., mineral soil, burned mineral soil, and duff) in combination with insolation (i.e., full sun, half shade, full shade).

New Techniques Having Limited Field Use

1. Distinguishing between diseased and normal pine bark. In response to a request from Washington, a study was made of reagents which could be used to identify diseased and normal bark. On freshly cut thin sections of pine twigs, or thin strips of bark and stem cambium, standard ferric chloride (tannin test) and iodine + potassium iodide (starch test) reagents were absorbed by and showed their typical blue-black colorations much more rapidly in the diseased than in the normal bark. A combination of alpha-naphthol and concentrated sulfuric acid actually showed a color differentiation between healthy and diseased tissue but this reagent is not too convenient for field use. On the surface of pine bark the presence of an incipient canker, or the margin between diseased and healthy bark, was clarified and intensified by a few drops of xylol. A small dropping bottle with a ground glass cork is a handy container for carrying xylol in the field. This reagent should be useful on plot work or strip surveys for checking on questionable incipients.

2. Identifying underground parts of ribes capable of sprouting. Laboratory tests on ribes garden material later confirmed by extensive field tests showed that stolons, buried stem, or layering stem may be readily distinguished from true roots by examining for pith and confirming its presence by examination under a hand lens or by the so-called "pin test." Under gentle pressure of a pin or a sharp knife-point, pith feels soft and spongy. A hard, woody center is typical of a root and the soft pith indicates a stem which, of course, is capable of sprouting. If the specimen contains stem tissue its central core will stain black or dark blue with ferric chloride or iodine-potassium iodide, the same reagents used for distinguishing between diseased and healthy pine bark.

Greenhouse Tests on Growth Habits of Ribes

The effects of grazing animals and destructive rodents and insects on ribes seedlings are important in the cycle of ribes regeneration. To augment field data on this subject, a series of cutting tests were made on ribes seedlings in germination flats and in transplant flats. Tests were made with ribes seedlings at various stages in their development up to the time that the fourth leaf had developed. In some cases cotyledons were snipped off, and in others the seedlings were cut below cotyledons or at a point which would remove cotyledons plus one or more leaves. It is particularly interesting to note that ribes seedlings have considerable vigor even at the cotyledon stage (no leaves developed). Ten per cent of those which were

supposedly cut off "below cotyledons" survived and finally put out leaves. Thus some sprouting may occur following any cutting which fails to remove all potential growing points around the cotyledons. After the first two leaves had appeared, 50 per cent of the seedlings in the germination flats survived decapitation at cotyledon level. Further tests are planned for the winter of 1942-43.

In California the inevitable association of R. roezli and Ceanothus cordulatus suggested the comparison under controlled greenhouse conditions of the growth rate and vigor of R. roezli with and without C. cordulatus in immediate association. Mr. Quick noticed that the C. cordulatus carried root nodules which were suspected to have the function of fixing nitrogen. Accordingly greenhouse tests were made which included a series of seedlings of R. roezli and C. cordulatus growing alone and in association. One group of cultures were inoculated with mashed root tubercles collected in the field from snowbrush plants; a group of controls were not inoculated. In general the aerial parts of R. roezli were appreciably larger and more vigorous when grown in association with seedlings of C. cordulatus (mixed culture) than when grown alone (pure culture). The reverse was true of snowbrush seedlings. In pure cultures, the tops of snowbrush seedlings were heavier than the tops of gooseberry seedlings. In pure culture both species favored natural forest soil over autoclaved forest soil. Top root ratios for both species were higher in pure cultures than in mixed cultures. The top root ratios of snowbrush were, in general, much higher than such ratios for gooseberry seedlings. The growth of snowbrush was not dependent upon inoculation by root-tubercle organisms, that is, snowbrush seedlings grew in autoclaved uninoculated soil. The detailed data remain to be analyzed and reported.

Experimental Germination of Ribes Seeds

In terms of man-hours expended, germination of ribes seeds has been the most important greenhouse and laboratory assignment at Berkeley for the past seven years. The 1942 report on seed germination tests (see Serial No. 114) described work on 26 ribes species for which 1,017 cultures were prepared containing 69,755 seeds. Depth of planting and aeration were made the subject of additional germination tests not yet summarized and further tests on the same topics are planned for the winter of 1942-43. The effects of depth of planting and aeration were noted several years ago in preliminary tests but are now being studied more intensively because of their relation to soil properties and to degree and type of soil disturbance by fire, logging, windthrow, erosion, and grazing. Forced aeration by continuous passage of moisture-laden air downward through the cultures did not help germination at a planting depth of one and one-half inches, but did indicate somewhat better results than watering with boiled and distilled water (lack of aeration) on shallow-planted cultures.

The following special reports have been prepared in final or preliminary draft during 1942:

Bureau MS No. 6552:
"Self-Incompatibility in Several Species of Ribes in the Western States" ..... Harold R. Offord, Clarence R. Quick, and Virgil D. Moss

Serial No. 114:
"Experimental Germination of Ribes Seeds. Series of 1941" ..... Clarence R. Quick

Serial No. 115:
"Preliminary Report on the Use of Germinated Seed as a Method of Reforestation for Western White Pine" ..... Virgil D. Moss

Spokane Office Report:
"Ribes Eradication Methods Study for 1942"
1. St. Joe Operation
2. Clearwater Operation
..... Virgil D. Moss, with the collaboration of personnel from St. Joe and Clearwater.

PHOTOGRAPHIC AND EDUCATIONAL WORK, 1942

By
Edward L. Joy, Forester
H. Miller Cowling, Chief Scientific Aid

Although the photographic and educational work of 1942 included the usual wide variety of subjects, the scope of this activity was considerably reduced as a war economy measure. Included in the activities of this department are still and moving picture making in both monochrome and color, laboratory processing, Multilith printing, black-line printing, mimeograph reproducing and drafting. Several of these services are performed for both the Northwestern and the Sugar Pine Regions. Other agencies served included the Soil Conservation Service, the office of Pear Psylla Control and the blister rust investigations phase of the University of Idaho School of Forestry. In view of the large amount of service received, the Pear Psylla Control office pays half of the salary of H. Miller Cowling.

Educational activities which are carried on by all members of the technical staff include training programs for blister rust control crews, lectures both with and without slides, both the Eastern and Western motion pictures on blister rust, posters, pamphlets, preserved specimens of the rust, photographs and news items. The items used most extensively are the two moving pictures, both of which are color productions.

The following reports give in detail information on the year's work of these projects:

A. Photographic Section

The major objectives of this section are: (1) the maintenance of a pictorial record of control and investigative work, (2) the supplying of photographs, charts, maps, manuals, etc. for facilitating the field work and (3) the production of material for educational purposes. The amount of work performed under (1) and (2) was considerably reduced this year.

Again in 1942 the production of Multilith machine work was increased. This included forms, tables, graphs, charts, maps and photographs. Of particular note here is the fact that multicolored maps for annual report purposes were produced for both western regions. It is estimated that the production of these maps by this method saves from 80 to 90 per cent in labor and nearly this much in materials cost over the hand-coloring method. The type of work produced in this manner is to be found in various parts of this and other volumes of "Blister Rust Control Work in the Far West."

Large numbers of maps for field and report uses were made on the black-line printing machine. The office of Pear Psylla Control in particular had large requirements. Color photography was again used, but to a lesser extent than in 1941.

Throughout the year the mimeograph machine was in use for the production of a large volume of work. Operation of this machine is handled jointly by the

photographic and stenographic personnel. No work for Pear Psylla Control was done this year due to the purchase of a machine for their use.

Special mention is necessary for a piece of work done in 1942, namely, the revision of the eradication and checking manuals. For the first time these books were combined in one volume, which is in line with the change in title and assignment of the "Checking Supervisor" to "Assistant to Operation Supervisor." The closer working relationship accomplished by this change was facilitated by production of a single manual covering both phases of the work.

The summary of reproduction work by photographic and machine methods for 1942 is given in the following table:

PHOTOGRAPHIC, MULTILITH, BLACK-LINE AND MIMEOGRAPH WORK

Item		North-western Region	Sugar Pine Region	Pear Psylla Control	Other Agencies	Total
PHOTOGRAPHIC						
Lantern slides, natural color		131				131
Films, developed, field films		87				87
Copies,	5x7	2	1	58		61
	8x10	84	13	16		113
Printing,	4x5 or smaller		30	36		66
	5x7	1,040	20	184		1,244
	8x10	41				41
	9x11	814	261	184		1,259
	on 5x7 film			13		13
Enlarging,	11x14 or smaller			91		91
	14x17			83		83
	16x20	1	59	32		92
	20x24			17		17
	on 5x7 film			13		13
Total Items		2,200	384	727		3,311
MULTILITH						
Copies		84	31	50	81	246
Plates made		142	61	48	102	353
Cards printed		1,000	5,850	37,900	1,750	46,500
Cards printed, reverse		1,000	5,000	37,900	1,750	45,650
Total cards		2,000	10,850	75,800	3,500	92,150
Paper printed		39,300	7,500	116,900	134,500	298,200
Paper printed, reverse		8,500	8,500	40,000	121,500	178,500
Total paper		47,800	16,000	156,900	256,000	476,700
Total Items		50,026	26,942	232,798	259,683	569,449
BLACK-LINE PRINTER						
Total maps, printed		585		3,041	258	3,884
MIMEOGRAPH						
Total paper		43,292			700	43,992
Grand Total All Items		96,103	27,326	236,566	260,641	620,636

B. Educational Section

Due to the increase in war activities the need for and the requests for educational material decreased in 1942. No changes were made in the bulletins, posters, pictures, etc. that were used except that the Eastern blister rust motion picture was added. No further changes were made in the Western blister rust motion picture.

There follows a summary of the range of use in 1942 of the material listed:

1. Bulletins, posters and specimens. About ten bulletins, one poster and preserved specimens in several forms are available for distribution to blister rust workers, schools, colleges and others interested in this work. The total of all bulletins, posters and maps distributed in 1942 was approximately 700. Only a scattered few specimens were sent out during the year.

2. Talks, slides and motion pictures. Practically all of the talks on blister rust were those of the question-and-answer type that followed the showing of one or both of the blister rust movies. Occasional use was found for lantern slide showings, and in each instance short talks followed. The 1942 record of blister rust moving picture showings, which does not include projections of the Forest Service-owned copy, is as follows:

	Number Showings	Number People
Western motion picture	37	2,668
Eastern motion picture	24	688

3. Fairs and exhibits. During 1942 only one showing under this category was made although the blister rust diorama was available to this region for the first time. This display was used during Idaho State Forestry Week as an exhibit along with others at the University of Idaho. Following this showing and for the balance of the year this display was used in the School of Forestry building.

4. General publicity. From time to time news items on the blister rust control work, the labor shortage angle and other related items appeared in papers of the region. No special or feature articles on this project were noted.

APPENDIX

APPROPRIATIONS
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE
NORTHWESTERN REGION

Regular Appropriations

Fiscal Year 1942:

Project 3101.14 (Administrative)	$75,605.74	
Project 3103.14 (Cooperative)	27,041.00	
		$102,646.74

Fiscal Year 1943: (as of 12/31/42)

Project 3101.14 (Administrative)	$80,000.00	
Project 3103.14 (Cooperative)	64,695.00	
		$144,695.00

ERA (WPA) Allotments

Fiscal Year 1942: (7/1/41-12/31/41)

Idaho	$47,673.44*
Washington	$11,534.95*
Administrative	$ 2,600.00

Contributed Funds: (deposited with U. S. Treasury)

State of Idaho	$22,106.35	
Clearwater Timber Protective Association	6,000.00	
Potlatch Timber Protective Association	5,200.34	
Priest Lake Timber Protective Association	4,240.44	
		$37,547.13

*Net allotments after rescission of unobligated balances.

TABLE 1

FEDERAL EXPENDITURES, NORTHWESTERN DIVISION OF BLISTER RUST CONTROL
CALENDAR YEAR 1942, REGULAR APPROPRIATIONS

	Project	Salaries	Expense	Total
	January 1 to June 30, 1942			
I.	Planning, Coordination and Technical Direction			
	1.1 - Clearwater Operation, Idaho	$ 3,095.81	$ 589.12	$ 3,684.93
	1.2 - St. Joe Operation, Idaho	5,295.16	1,356.79	6,651.95
	1.3 - Coeur d'Alene Operation, Idaho	1,688.23	52.18	1,740.41
	1.4I - Kaniksu Operation, Idaho	3,670.34	1,662.11	5,332.45
	1.5I - Mount Spokane Operation, Idaho	708.30		708.30
	1.6C - Cabinet Operation, Montana	1,424.88	97.17	1,522.05
	1.7G - National Park, Glacier	441.62	121.65	563.27
	1.7R - National Park, Mount Rainier	149.98	69.50	219.48
	1.8 - Farm Wood Lot Survey	424.98	29.59	454.57
	1.A - Office Maintenance	10,340.21	2,774.85	13,115.06
	1.B - Supervision	4,549.86	252.18	4,802.04
	1.C - Education and Information	784.46	164.67	949.13
	1.D - Control Investigations	3,966.23	96.51	4,062.74
	1.E - Methods Development	154.66	7.24	161.90
	Total, Project I, January 1 to June 30, 1942	$36,694.72	$7,273.56	$43,968.28
III.	Cooperative Ribes Eradication on State and Private Lands			
	3.1 - Clearwater Operation, Idaho	5,785.17	2,567.56	8,352.73
	3.2 - St. Joe Operation, Idaho	5,883.02	622.15	6,505.17
	3.4I - Kaniksu Operation, Idaho	3,293.57	2,026.12	5,319.69
	Total, Project III, January 1 to June 30, 1942	$14,961.76	$5,215.83	$20,177.59
	July 1 to December 31, 1942			
I.	1.1 - Clearwater Operation, Idaho	3,137.17	264.75	3,401.92
	1.2 - St. Joe Operation, Idaho	4,809.39	870.05	5,679.44
	1.3 - Coeur d'Alene Operation, Idaho	1,699.92	84.80	1,784.72
	1.4I - Kaniksu Operation, Idaho	1,842.53	415.63	2,258.16
	1.6C - Cabinet Operation, Montana	1,399.92	159.50	1,559.42
	1.7G - National Park, Glacier	849.96	146.45	996.41
	1.7R - National Park, Mount Rainier	849.96	147.02	996.98
	1.A - Office Maintenance	9,674.76	2,681.92	12,356.68
	1.B - Supervision	4,499.88	295.86	4,795.74
	1.C - Educational and Information	298.33	38.52	336.85
	1.D - Control Investigations	4,180.86	245.57	4,426.43
	1.E - Methods Development		1.19	1.19
	1.X - Poison Oak Eradication*	491.09	323.80	814.89
	Total, Project I, July 1 to December 31, 1942	$33,733.77	$5,675.06	$39,408.83
III.	3.1 - Clearwater Operation, Idaho	1,941.42	2,433.36	4,374.78
	3.2 - St. Joe Operation, Idaho	7,992.29	2,192.09	10,184.38
	3.4I - Kaniksu Operation, Idaho	2,348.97	1,794.86	4,143.83
	Total, Project III, July 1 to Dec. 31, 1942	$12,282.68	$6,420.31	$18,702.99

*H. J. Hartman - reimbursement to be made our allotment by the Army.

TABLE 2

FEDERAL EXPENDITURES, NORTHWESTERN DIVISION OF BLISTER RUST CONTROL,
SUPPLEMENTAL - JULY 1 TO DECEMBER 31, 1941*
801085-652999 EMERGENCY RELIEF, AGRICULTURE, ENTOMOLOGY AND PLANT QUARANTINE
FEDERAL NON-CONSTRUCTION PROJECTS CONTINUED,
(TRANSFER FROM WPA) 1942 - DECEMBER 31, 1941

Project	Salaries	Expense	Total
201-2-92-16, Idaho			
8.1 - Coop. Ribes Eradication, Clearwater Operation		$ 62.92	$ 62.92
8.2 - Coop. Ribes Eradication, St. Joe Operation		10.92	10.92
8.4 - Coop. Ribes Eradication, Kaniksu Operation		56.33	56.33
8.5I - Coop. Ribes Eradication, Mount Spokane Operation		1.10	1.10
Total, 201-2-92-16, Idaho		$131.27	$131.27
201-2-93-60, Washington			
8.5W - Coop. Ribes Eradication, Mount Spokane Operation		3.25	3.25
8.A - Office Maintenance		64.40	64.40
Total, 201-2-93-60, Washington		$ 67.65	$ 67.65
Grand Total, July 1 - Dec. 31, 1941, supplemental*		$198.92	$198.92
801006-652999 EMERGENCY RELIEF, AGRICULTURE, CONTINUATION OF EXISTING PROJECTS, ADMINISTRATIVE EXPENSES (TRANSFER FROM WPA) 1942 - DECEMBER 31, 1941			
201-9-00-1, Administrative			
8.A - Office Maintenance	$15.00		$15.00
Total, Administrative, supplemental*	$15.00		$15.00

*Paid since 1941 annual report.

TABLE 3

SUMMARY OF EXPENDITURES FROM STATE AND PRIVATE FUNDS
1928 - 1942 IDAHO

Year	State	Private	Total
1928	$ 2,518.55	$ 2,264.32	$ 4,782.87
1929		19,027.66	19,027.66
1930		20,000.00	20,000.00
1931	5,000.00	35,905.32	40,905.32
1932	8,003.43	11,186.33	19,189.76
1933			
1934	29,154.06		29,154.06
1935	15,000.00		15,000.00
1936	16,998.25		16,998.25
1937	15,001.25		15,001.25
1938	15,000.44		15,000.44
1939	15,438.04		15,438.04
1940	10,034.48		10,034.48
1941	7,542.73	15,756.40	23,299.13
1942	22,761.68	15,440.78	38,202.46
Total	$162,452.91	$119,580.81	$282,033.72